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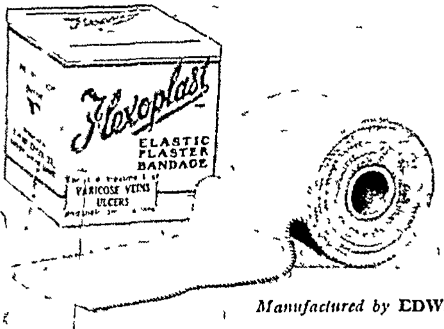

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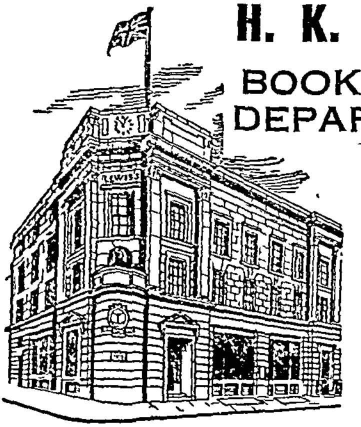

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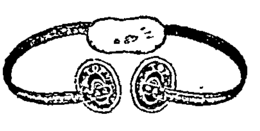

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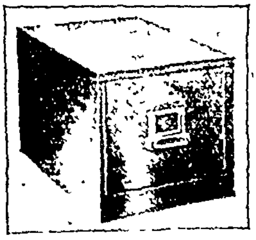

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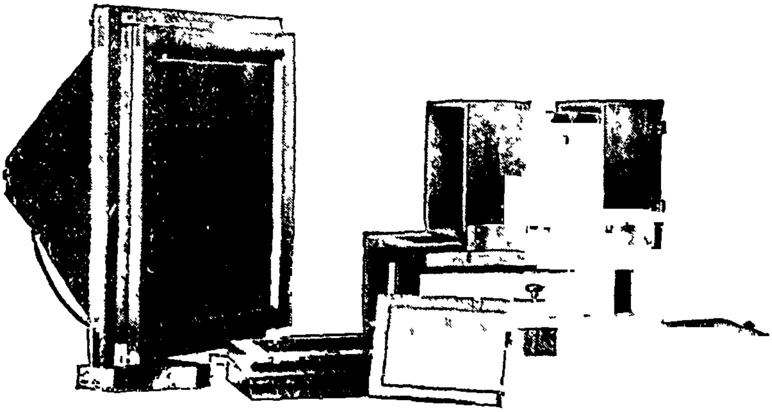

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A Clinical and Pathological Study of Arthritis.

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Contents include :—Physiology and Chemistry of Joint Structures—Classification of Arthritis—Classification of Joint Diseases—Tuberculosis—Traumatic Arthritis—Arthritis Associated with " Loose-body " Formation—Pyogenic Infection of Joints—Arthritis of Uncertain Origin—Degenerative Arthritis—Case Histories—Bibliography—Index.

Pp. 207. 50 Illustrations, 9 Plates (6 in Colour). **52s. 6d. net.**

Oxford University Press

HUMPHREY MILFORD,
Telephone : CITY 2604.

Amen House, Warwick Square, London, E.C.4
Telegrams : FROWDE, CENT., LONDON.

ADDRESSES AND ORIGINAL ARTICLES

DIAGNOSIS OF CONGENITAL DEFECTS OF THE EYE.*

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(WITH ILLUSTRATIONS ON SPECIAL PLATE.)

OPHTHALMOLOGISTS have long been noted for the interest, often purely academic, which they take in developmental aberrations, sometimes of the most minute. The original stimulus to the advance of this branch of the specialty came from Germany whence have always emanated the most painstaking studies and collections of such cases. Of recent years interest has been further stimulated by the discoveries of slit-lamp workers, who emphasise the extreme frequency of slight deviations from the normal, and by the more intensive study of embryology, which has allowed of better understanding of their production. Thus emerge the two points of view from which to consider such conditions, the clinical and the embryological, and it is the aim of this lecture to show how the first and practical outlook may be combined with the second, theoretical, to the benefit of both.

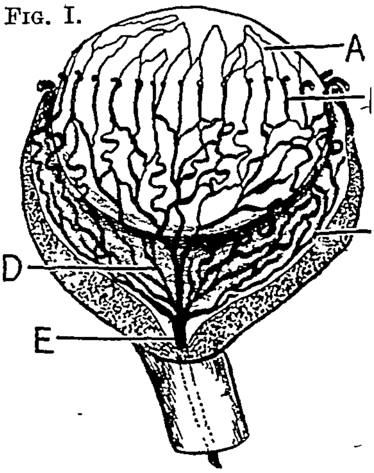
Whoever studies cases of developmental defect of the eye will be struck by the frequency with which they resemble in many ways the results of acquired disease. Conversely many acquired conditions come to reproduce with varying accuracy the possible results of developmental aberrance. The chief interest of the subject lies in the disentangling of the appearances so as to arrive at a knowledge of the past causative agents. In most cases the problem is not an urgent one, since the more dramatic of the acquired diseases usually present no resemblance to congenital defects. Their remote results, however, may come to suggest very strongly certain developmental anomalies. As good an example as any is seen in the fact that pathological pigment on the lens capsule from past inflammatory synechiæ tends after the lapse of years to assume a stellate form indistinguishable in appearance—though often not in position—from the congenital star-shaped pigment cells of minimal persistent pupillary membrane. Thus a past attack of iritis may be misinterpreted and its possible present bearing on the case overlooked. An even more common dilemma—though only likely to puzzle the relatively inexperienced—is that of the diagnosis of medullated retinal nerve-fibres from exudate due to inflammatory or vascular disturbance, especially should they occur in a patient with renal or cardiovascular disease.

In dealing with this question of differential diagnosis it appears advisable to consider the commonest problems in the first place from their anatomical position. On this basis they can be divided into those involving the anterior parts of the eye and therefore visible by focal illumination, and those involving the fundus and only visible ophthalmoscopically. Obviously in some cases both situations present defects, the diagnosis thereby being rendered considerably easier, as when the presence of a doubtful pupillary membrane is made more certain by t presence of a coloboma of the disc in the same eye

Abnormalities Involving the Anterior Part.

It is obvious that the abnormalities involving t cornea, anterior chamber, iris, and lens, cannot dealt with in detail. The most salient only can mentioned here. The majority of congenital a acquired defects in this situation which mig possibly be confused with each other are vascular nature. Such occurrences as visible blood-vessels on the iris, vascular strands, or apparent synechiæ connecting the iris with the lens or cornea, and membranes closing the pupil are all capable of misinterpretation. The first essential in understanding them is a knowledge of the normal arrangement of the fœtal vessels in this region. Fig. I. shows the arrangement of the fœtal intraocul blood-supply at the height of its development. It w be seen that the hyaloid artery entering at the opt disc breaks up into two sets of branches, the va hyaloidea propria, supplying the vitreous, and t network of vessels on the lens, forming its posteri vascular capsule. These latter unite around t equator of the lens and run forwards as the straig parallel vessels of the capsulo-pupillary portion the tunica vasculosa lentis to break up again in two sets of branches, one composed of vessels turni round the margin of the optic cup and draini into choroidal vessels, the other forming loops ov the anterior surface of the lens and constituting t pupillary membrane. The more peripheral loops the pupillary membrane remain as the large supe ficial vessels of the iris stroma, anastomosing at t lesser circle. All the rest of the system disappea

FIG. I.



(A) Pupillary membrane. (B) Capsu pupillary part of vascular capsule. (C, Vasa hyaloidea propria. (E) Hyaloid arte

PERSISTENT PUPILLARY MEMBRANE.

Certain points in connexion with the pupilla membrane should be borne in mind when diagnosi its persistence. In the first place, the vess composing it form a definite radial net connect by an arcade-like arrangement somewhat resembli Gothic arches. They never run either strictly parall or tangential to the pupil margin but always as near radial as possible. The lesser circle of the i represents the arcades back to which the atrop has extended. Any persistence of the membra must therefore show a radial arrangement and attached to the lesser circle.

Secondly, although the vessels are very thin-wall at birth, their coats rapidly thicken and in the pe pheral parts of the membrane which normally persi this thickening is sufficient to hide the colour of t blood stream entirely. Sometimes these vess dilate—in early iritis, sometimes only from irritation due to a corneal foreign body, and sometimes in fair-complexioned people as a permanent condition—but even then the walls can easily be seen as definite white lines on either side of the blood column. In cases of pathological formation of new vessels on the iris, on the other hand, the vessel walls are usually almost invisible.

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* The Richard Middlemore lecture delivered at the Birmingham and Midland Eye Hospital on Dec. 31st, 1931.

Thirdly, remains of pupillary membrane may appear under a very large variety of forms, ranging from complete persistence of the whole structure to the presence of a single minimal tag attached by one end to some portion of the lesser circle. This latter form is so common (probably over 25 per cent. of all individuals) as to be considered a normal variation. Sometimes the persistent pupillary membrane is pigmented. This is not surprising, for it is morphologically a part of the iris stroma. It should be possible to recognise that this pigmentation is of mesodermal type and is not uveal, but this may be difficult intra vitam. Again the persisting portion of the membrane may be small and adherent to the lens capsule. For this reason the presence of pigmentation in an apparent synechia is no criterion of its inflammatory origin. Its peripheral attachment and general arrangement will prove a much safer guide. (Very occasionally where the whole pupil has at some time been blocked by exudate an inflammatory synechia may be attached to the lesser circle instead of to the pupil margin. This is usually not misleading since it is only found in eyes with gross evidence of disease.)

PATHOLOGICAL CONDITIONS SIMULATING PERSISTENT PUPILLARY MEMBRANE.

It might be thought from the foregoing remarks that given an exact knowledge of the appearance of the fœtal iris, the diagnosis of pathological conditions should be easy. There are, however, in my experience three conditions which may in their final results lead to permanently visible vessels on the iris and so prove misleading. They are, in order of frequency, thrombotic conditions (usually of the vena centralis retinæ and/or one or all of the venæ vorticosæ), past severe iridocyclitis, and trauma in early life.

The *thrombotic* cases are usually immediately diagnosable by their history (sudden onset in middle or later life with immediate impairment of vision and usually rise of tension) but they are interesting on account of the arrangement of the visible vessels. In incomplete cases the vessels visible are merely dilated stroma vessels of the iris. In more severe cases they are actually vessels of new formation, thin-walled, very numerous, and arranged on a plane superficial to the stroma and running often almost at right angles to the stroma vessels and in an entirely haphazard way. Fig. II. (on the Plate) shows them in a typical case. The patient was a man of 54 who had had a thrombosis of the venæ vorticosæ of the right eye eight weeks previously. The tension was raised but there was no pain. It will be seen that the main vessels arise at the periphery in the inferior quadrant and crossing the radial vessels at right angles run a course parallel with the periphery of the iris towards the horizontal meridian, where they break up into a dense plexus of capillaries. In places dilated stroma vessels can be seen running radially and anastomosing with this newly formed plexus. In more severe cases or after a longer time newly formed vessels may leave the iris margin and encroach on the pupil area. They form irregular leashes in most cases and do not resemble normal pupillary membrane vessels nearly as much as do the new vessels in the second (inflammatory) group of cases now to be dealt with.

The *inflammatory* cases are usually due to irido-cyclitis of long standing, often tuberculous. They form a very interesting group, worthy of greater attention from a pathological point of view than it is possible to give them here. For our present purpose their importance lies in the fact that the first apparently new vessels to become visible are merely dilated superficial stroma vessels—i.e., peripheral part of pupillary membrane—while subsequently entirely new vessels bud centrally from these and attempt to reproduce with a varying amount of success the previously atrophied central loops on the pupil area. The similarity of the new membrane—cyclitic membrane closing the pupil and subsequently thinning considerably—to a normal pupillary membrane of the fifth to sixth month of intra-uterine life is often very striking. In some cases even the anastomoses with the capsulo-pupillary vessels curling over the edge of the iris is reproduced. Fig. III. (on Plate) shows such a case. The patient was a man of 48, who had had a severe irido-cyclitis following an injury at the age of 9 (whether perforating or not was not known). There was no clinical evidence of perforation. In this case the new vessels all lie just superficial to the stroma. The loops over the pupil are almost exactly like those of a normal pupillary membrane at six months. A number of large vessels pass behind the iris by curling round between it and the lens as do the palisade vessels of the capsulo-pupillary membrane. The case could, however, be distinguished from a congenital condition even if the history were not known, by at least two criteria. In the first place the pupillary loops do not come off the lesser circle but are directly in continuity with the radial vessels. Secondly the vessels passing backwards round the edge of the iris are much too large relative to the pupillary loops, and they do not anastomose with these as peripherally as they should, or in as regular a manner. If further evidence were needed the thinness of the vessel walls and the absence of pigment must also be taken into account.

The traumatic cases are possibly always associated with a past irido-cyclitis, though this is not always evident, since the need for differential diagnosis in these cases obviously never arises until long after the subsidence of all signs of active inflammation. There is often only a vague history of a blow on the eye in childhood. In one case the patient was a myope and the retina of the affected eye was detached. There is almost always an interval of ten years (in two of my cases over 30 years) between the original injury and the subsequent examination which reveals the condition. In some cases there is no history at all, which in itself leads one to consider the possibility of a congenital origin.

CONGENITAL DEFECTS OF THE LENS.

Congenital defects of the lens are usually self-evident and the well-known appearances of lamellar, suture, and coronary cataract need not detain us. There is, however, one type of lens opacity which can arise either as a developmental defect or as the result of trauma in early life. This is the reduplication cataract or "Kalk." In this type there is an opacity on the lens capsule and a reduplication of this deep to it in the substance of the lens. The two opacities are separated from each other by clear cortex through which often runs a narrow stalk uniting them. For this reason it is also sometimes called a collar-stud opacity. The reason for the appearance is the fact that growth of normal lens cortex has taken place after the injury and has separated the originally injured lens fibres from the scar in the overlying capsule. When the condition is traumatic it can obviously occur at any situation. In congenital cases it is almost always at the equator or at the anterior or posterior pole. In these cases the original adverse influence appears to be pressure—i.e., at the anterior pole pressure against the cornea; at the equator pressure of a capsulo-pupillary vessel; at the posterior pole of an abnormal hyaloid. In making the diagnosis traces of these agents should be sought. In the congenital equatorial Kalks there is in my experience always a coloboma of the iris, which makes the diagnosis simple, unless this be mistaken for the result of an injury also, which is unlikely.

Abnormalities Involving the Posterior Part.

Innumerable descriptions of abnormalities of the posterior part of the eye have been published since the discovery of the ophthalmoscope so that it is unnecessary to go into them in any detail. There are however a few (six) to which attention may be called because both the congenital condition and the acquired, with which it may possibly become confused, are relatively common.

Coloboma of the choroid.—When large in area and found in its typical situation below the disc, will hardly give rise to difficulty in diagnosis, especially as it so often is associated with a coloboma or other abnormality of the iris. The smaller atypically situated colobomata of the choroid are however very likely to be confused with patches of old choroiditis. Indeed, in many cases it is almost impossible to distinguish between them. Nevertheless, there are certain criteria which will assist in deciding whether a lesion is congenital or not—whether it is inflammatory or not is immaterial since many colobomata are possibly due to intra-uterine inflammation. The points to consider are the amount of ectasia, the distribution of the vessels, and the amount of pigmentation. It can in general be said that the earlier in life the process starts the greater the likelihood of ectasia and abnormality of vessels and the less the amount of pigment. Therefore a white ectatic lesion at the macula associated with an abnormal anastomosis between retinal and choroidal vessels in the patch is certainly a macular coloboma. It has arisen in all probability at or before the 100 mm. stage of human development, since this is the stage of appearance of the arteria centralis retinæ. In a case published by Dr. J. A. Ross and myself[1] the time of origin of the patch could be placed with a fair amount of accuracy during the fourth month of intra-uterine life, from a consideration of the concomitant vascular abnormality (destruction of chorio-capillaris and vascularisation of a quadrant of the retina by choroidal vessels). If any remains of the vasa hyaloidea propria are found in connexion with the patch its origin is placed even earlier—i.e., before the normal disappearance of these vessels at the beginning of the third month.

Medullation of the retinal nerve-fibres has already been touched on as being likely to be confused with retinitis. Once the silvery shining striated appearance of the fibres has been recognised there should be no difficulty. The condition is interesting as an example of a developmental anomaly which is not congenital, since it occurs during the first few months of life.

Choroido-vaginal veins.—These are large choroidal veins, resembling venæ vorticosæ, but draining into veins of the sheath of the nerve and visible on the edge of the disc. They appear as flat red streaks and are easily mistaken for hæmorrhages. They are only visible in light coloured myopic fundi, but are possibly much commoner than is thought to be the case.

Persistent hyaloid artery occurs in varying degrees of completeness. It may be mistaken for an inflammatory exudate in Cloquet's canal or for an early retinitis proliferans.

Replacement of the arteria centralis retinæ by cilio-retinal arteries.—In some cases in man and normally in most of the carnivora the retina is supplied by cilio-retinal arteries only. Since these appear suddenly at the edge of the disc, the centre being avascular, the condition may easily be mistaken for a pathological cupping of the disc with extreme kinking of the vessels at the margin.

Pseudo-neuritis is a slightly blurred raised appearance of the disc seen sometimes in healthy hypermetropic eyes. It is probably due to congenital smallness of the foramen scleræ. It may be mistaken for papillœdema unless it is borne in mind that its swelling is barely measurable and that there are never any appearances suggesting hæmorrhage.

There are of course many other conditions which, occurring congenitally, may yet be confused with acquired conditions of greater import. With these I cannot deal here; but in conclusion it may be again pointed out that a knowledge of normal embryology can be possibly of greater assistance in ophthalmological diagnosis than in examining almost any other region or organ.

DIAGNOSIS AND TREATMENT OF PINEAL TUMOURS.

WITH REPORT OF A CASE.

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(WITH ILLUSTRATIVE PLATE.)

Tumours of the pineal body are sufficiently rare to remain as pathological curiosities, although records of no less than 113 cases were collected by Haldeman[21] in 1927. It is only within the last 25 years that knowledge of the symptomatology produced by pineal tumours has become sufficiently crystallized to afford reasonable grounds for an accurate diagnosis, since the writings on the subject by Frankl-Hochwart, Hinds Howell, Pellizzi, and more recently by Foerster, Horrax and Bailey, and others. The pineal gland lies immediately above the quadrigeminal plate and the aqueduct of Sylvius, and tumours arising in it may be expected to produce firstly symptoms of obstructive hydrocephalus, from obliteration of the aqueduct by pressure, and later, symptoms of pressure on the superior corpora quadrigemina. Persistent headache, occasional giddiness, and papillœdema are likely to be followed by ptosis, limitation of

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[1] Brit. Jour. Ophthalmol., 1929, xiii., 608.

* Working under a grant from the Rockefeller Foundation.

upward movement of the eyes, and loss of pupillary reaction to light. Pressure on the inferior corpora quadrigemina may give rise to disorders of hearing, as in our case.

Pineal tumours were formerly thought to be inoperable, but in the last 15 years attempts have been made to remove them by Dandy, Foerster, van Wagenen, and others with increasing success. The methods of exposure of the pineal region have been fairly well worked out, but further surgical experiences are required before the operation may be considered safe and free from the risk of serious disturbance of cerebral function. The vein of Galen is in intimate relation with the tumour, and if it is damaged death is likely to follow. As our case shows, serious consequences may also follow damage to its tributaries.

Report of Case.

The patient, a male aged 20, was first seen on March 16th, 1930, referred by Dr. J. S. Boden on account of headache, double vision, and papillœdema.

HISTORY.

His boyhood had been healthy and the only trouble of possible bearing on his illness was that between the ages of 16 and 19 he had had six attacks of momentary unconsciousness, each of which occurred on rising in the morning and without any warning. For six months before he came under observation he had had occasional giddiness on rising in the mornings, but this did not interfere with his activities in any way. On Feb. 24th, 1930, while out duck-shooting early one morning, he was overcome by severe throbbing pain in the back of the head which lasted for two hours. Thereafter similar attacks occurred each day at 4 A.M. and in one of these he vomited. Early in March, 1930, the headache became particularly violent and began to occur in the middle of the day as well as in the early morning. The pain spread to the right shoulder and there was difficulty in flexing the neck. At this time also he began to see double. He consulted Dr. Boden, who found that he had papillœdema and at once sent him to one of us (W. H.). Throughout his short illness he had heard a noise, like the noise of a sea-shell or a cork rattling on the window pane, whenever he was recumbent. It was heard in the ear that was against the pillow and persisted until he moved his head. On one occasion when the headache was particularly severe he staggered while walking, and at the same time felt as if he had taken too much alcohol. At other times he was quite steady in walking. His mother noticed that he was becoming somewhat hypochondriacal.

He was admitted to the nursing home on March 17th, 1930. The fundi showed bilateral papillœdema (right 5 D., left 4 D.). There was diplopia corresponding to paresis of the left inferior oblique, but no strabismus or nystagmus. There was slight incoördination of the left hand but no weakness. The knee-jerks and plantar reflexes were normal. The diagnoses considered at this time were tumour of the vermis, serous meningitis, and endothelioma of the dura of the posterior fossa.

Lumbar puncture yielded fluid under pressure which contained 30 white cells per c.mm. and a trace of globulin. This suggested the possibility of serous meningitis. At a second lumbar puncture two days later 30 c.cm. of fluid under pressure were withdrawn, but at a third, after another interval of two days, no fluid could be obtained except by aspiration. He remained under observation for six weeks. After the lumbar punctures headaches were less severe and the papillœdema receded about 1 D. Subsequently the papillœdema became worse and surgical intervention was obviously required if vision was to be saved.

EXAMINATION AND DIAGNOSIS.

April 25th, 1930.—The patient was a thin intelligent boy. His head was not enlarged. The occiput was rotated slightly towards the left and the muscles on the left side of the back of the neck were rather prominent. Acute flexion of the neck was painful. There was bilateral papillœdema of 5 diopters with old and recent hæmorrhages, but with each eye he could read Jaeger 1 at ordinary reading distance. The right pupil was slightly larger than the left, and both reacted rather sluggishly to light, but well on convergence. There was a squint and slight weakness of the outward movement of the left eye. Upward movement of the eyes appeared to be slightly defective, but not so much as to be considered significant. There was ptosis of both upper lids which were rather swollen. Whispers were heard at 5 ft. from each ear. His gait was normal, but the limbs were hypotonic, and on the left side slightly ataxic. Apart from some diminution of all the abdominal reflexes, cutaneous and tendon reflexes were normal. No disturbance of sensibility was detected. There was no abnormality of the external genital organs.

Radiography of the skull showed slight increase of convolutional markings and erosion of the dorsum sellæ. The pineal shadow was unusually well seen in view of his age, but it was not enlarged or displaced.

The history and examination indicated a rapid and severe rise of intracranial pressure. Such localising signs as could be detected were considered to indicate a lesion in the cerebellum, but at the same time it was felt that the poor reaction of the pupils to light and the weakness of upward movement of the eyes raised the alternative possibility, of a lesion in the quadrigeminal region. However, after further examination it was considered that these signs were not present in sufficient degree to warrant a diagnosis of quadrigeminal lesion, especially as there was no trace of deafness. After consultation with Dr. Gordon Holmes we decided to explore the cerebellum.

MR. WOODD WALKER: FOCAL OSTEITIS FIBROSA.
(See page 23).

LEGENDS OF ILLUSTRATIONS ON SPECIAL PLATE.

FIG. III.—Lateral view of the skull, showing extensive but localised bony changes in the parietal and occipital regions, with patchy absorption and considerable new bone formation.

FIG. IV.—The left hand, showing osteitis fibrosa of the first, fourth, and fifth metacarpals, and phalanges. All the epiphyses are joined almost five years before the usual time.

FIGS. V. AND VI.—Lateral and antero-posterior views of the thorax, showing osteitis fibrosa and deformity of the spine and ribs. The angulation, causing pressure on the spinal cord, is at the fourth dorsal vertebra.

FIRST OPERATION.

April 26th, 1930. (Intratracheal ether, gas and oxygen anæsthesia.)—During induction of anæsthesia there was considerable increase in the rotation of the occiput to the left. The posterior fossa was exposed by the Cushing cross-bow method. At the outset both lateral ventricles were tapped and from each came a large amount of cerebrospinal fluid under greatly increased pressure, thus confirming the clinical diagnosis of bilateral symmetrical hydrocephalus. On opening the dura the cisterna magna, which was rather large, was found to contain small air bubbles. These could only have come from the lateral ventricles as a result of tapping. This observation thus demonstrated the patency of the aqueduct of Sylvius and fourth ventricle, and was considered at the time, wrongly as it now proves, to exclude a pineal tumour. Both cerebellar tonsils were displaced downwards, the right rather more than the left, but neither of them had actually passed through the foramen magnum. The vermis was incised but no tumour was found in the fourth ventricle. A wide decompression having already been made the incision was closed.

POST-OPERATIVE COURSE.

There was rapid subsidence of the papillœdema and when the patient left the nursing home, 23 days after the operation, the swelling of the discs measured 0·5 to 1 D. Visual acuity was 6/9 in each eye, but he still saw double when looking to the left. Headache disappeared. Certain changes were now evident in the clinical picture. Vomiting which before operation had been remarkably infrequent now occurred each morning. The reaction of the pupils to light became very sluggish, especially on the right side, and convergence and upward conjugate movement of the eyes were now grossly defective. The abdominal reflexes could not be obtained on the left side and the left plantar reflex was occasionally extensor. His walking was not so steady as it had been before operation; he tended to fall to left or right, and he swayed when standing still. There was also slight spasticity of the lower limbs and of the left upper limb, but this disappeared before discharge.

These signs established fairly definitely the diagnosis of tumour in the pineal region. However, during the next five months he gradually improved. Apart from frequent vomiting he was free from discomfort, and by September, 1930, he was walking two miles

FIG II.

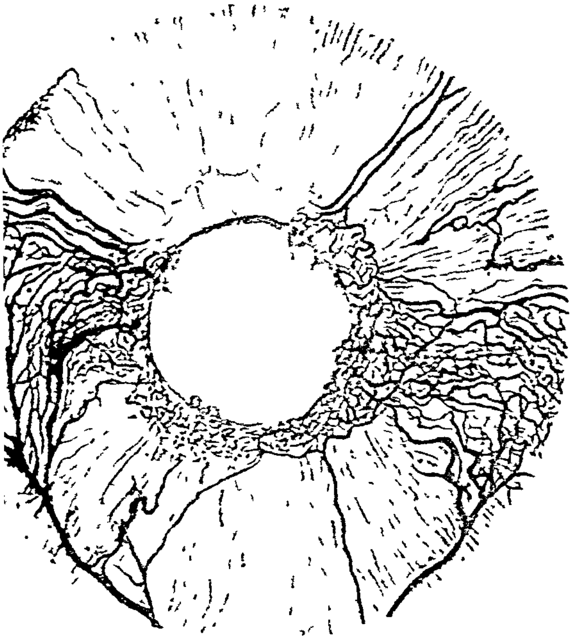
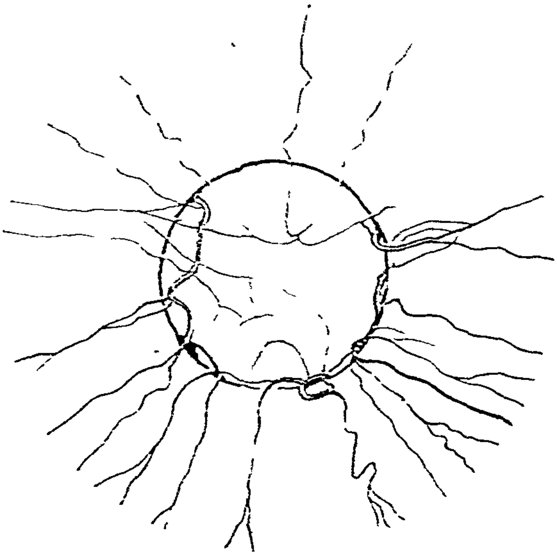


FIG III.



MISS IDA MANN: CONGENITAL DEFECTS OF THE EYE.

FIG III.

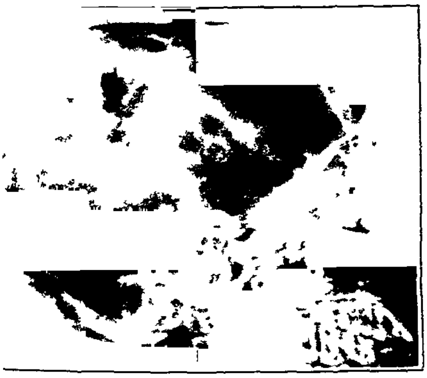


FIG. IV.

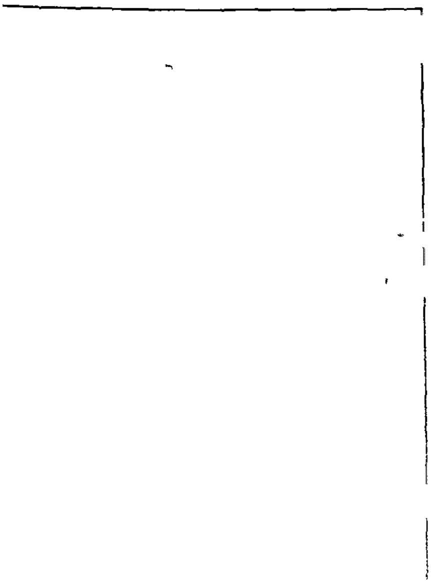


FIG V

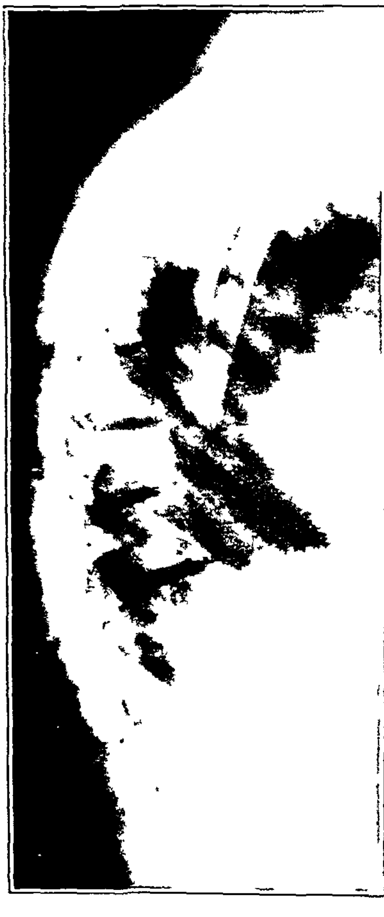
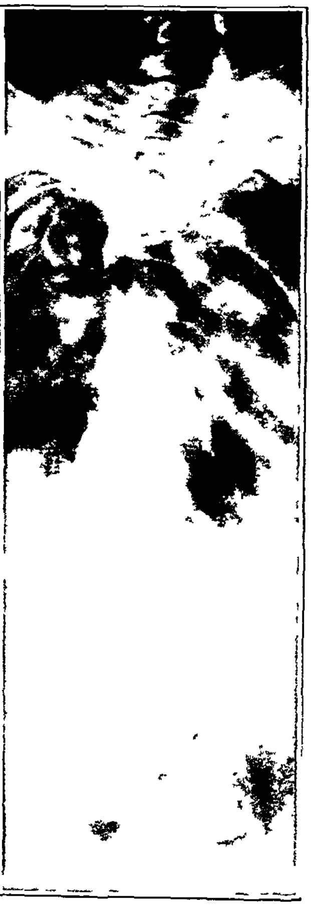


FIG. VI.



MR. WOODD WALKER:
FOCAL OSTEITIS FIBROSA.

and the gas and oxygen withdrawn the patient immediately recovered consciousness. At the same time his pulse-rate became rapid and uncountable and his blood pressure could no longer be registered at the brachial artery. A blood transfusion of 250 c.cm. citrated blood was given, but it is doubtful whether it materially improved the patient's condition for he had not lost much blood during the operation and his colour was good.

PATHOLOGICAL EXAMINATION.

The tumour (S.D. 2468, 1930) was examined by Dr. Dorothy Russell.

Macroscopic.—The tumour (Fig. III.) after fixation consisted of an ovoidal mass, measuring 2·8 × 2·3 × 2·2 cm. Its surface was finely lobulated and appeared to be covered by a thin transparent capsule and a few fine blood-vessels. The cut surface was composed of firm, homogeneous, finely granular yellow tissue which was semi-translucent at the margin and gradually became more opaque towards the centre. In the centre there were several points of calcification and a few minute cysts, up to 0·2 cm. diameter, which contained clear honey-like material. In addition to the main tumour there were numerous fragments, up to 0·8 cm. diameter, which had been collected from the posterior end when an attempt was being made to remove the tumour piecemeal. The total weight of the tumour was 8·75 g.

Microscopic.—Portions of the tissue were fixed in saline formaldehyde, Zenker's fluid, and in formalin-ammonium-bromide. Paraffin sections were stained in hæmatoxylin and eosin, iron hæmatoxylin and van Gieson's mixture, Weigert's fuchselin and neutral red, Mallory's phosphotungstic-acid hæmatoxylin, and Laidlaw's method for reticulum. Frozen sections were stained by Herxheimer's method for fat, Hortega's silver method for pineal parenchyma, and Cajal's gold chloride sublimate method.

The tumour is a non-encapsulated mass composed of a variety of different types of cells. The most abundant type is the so-called "pineal parenchyma" cell (Fig. IVA.), a large cell with finely or coarsely vacuolated, non-fibrillated cytoplasm and a relatively large nucleus containing from two to four conspicuous nucleoli and a close mesh of exceedingly delicate chromatin threads. There are no blepharoplasten. These cells are often seen in mitotic division and occasionally multinucleate giant cells are present. They are aggregated in solid masses of variable size, separated by a connective tissue stroma in which collagen fibres and an abundance of fine reticulum are demonstrable (Fig. VA.). At many points in this stroma are conspicuous focal collections of cells that are indistinguishable from small lymphocytes (Fig. VB.). In some portions of the tumour there are also groups of spindle or irregularly stellate neuroglial cells with a cytoplasm that is more deeply stained and more homogeneous than that of the pineal parenchyma cells (Fig. IVB.). The cytoplasm of these cells contains fibrils but no blepharoplasten. They bear some resemblance to fibrillary astrocytes, but are not impregnated by Cajal's method. Transition between these cells and the pineal parenchyma cells cannot be excluded. Hortega's silver method for pineal parenchyma does not show any cells with characteristic club-shaped processes. In one area near the centre of the tumour is a collection of irregularly shaped deposits of amorphous hæmatoxyphil material, presumably calcium.

This tumour thus clearly belongs to the type described by Bailey and others as pinealoma. Its histological structure bears a remarkable resemblance to that of a common tumour of the testis, variously described under the term alveolar sarcoma, séminome, spheroidal-celled tumour, and so forth. Some years ago one of us (H. C.) brought forward evidence which suggested that the spheroidal-celled tumour of the testis was a tumour of toti-potent cells (THE LANCET, 1926, i., 845). The type cell in this tumour is large, its cytoplasm is vacuolated, and its nucleus, often dropsical, contains one or more conspicuous nucleoli. The cells have a solid acinar arrangement, and the acini are separated by a network of collagen and reticulum around which are collected many small lymphocytes. The appearances, in fact, are practically identical with those of "pinealoma." In our case there were no clinical signs of disorder of the testis and there was no reason to suppose that the pineal tumour was a metastasis. The resemblance between the two types of tumour may be fortuitous, especially as Bailey and Horrax claim to have demonstrated processes on the "pineal parenchyma" cells of some of their tumours. However, we were not able to demonstrate any of the characteristic club-shaped processes in the cells of this tumour, although successful preparations were obtained from a normal gland used as a control. In view, therefore, of its close resemblance to spheroidal-celled tumour of the testis we are not able to exclude the possibility that this pineal tumour is a tumour of toti-potent cells. It may be more than coincidence that both the pineal gland and the testis, organs which are concerned with sexual function and which are known to give rise to teratomas, also give rise to spheroidal-celled tumours that bear a strong resemblance to one another.

POST-OPERATIVE COURSE.

When the patient was put back to bed five hours after the conclusion of the operation his pulse-rate was about 170, rectal temperature 103·8° F. He was conscious and moved all four limbs voluntarily, the right better than the left. Sensation to pin-prick was definitely diminished on the left side. His eyes were deviated to the right and downwards, and he could not move them to the left; this persisted for two days.† Occasional involuntary movements of the right upper and lower limbs occurred during the night.

On the day following operation his temperature fell to 100° and his pulse-rate to 110, but turning him from side to side still affected his general condition adversely. He now developed complete flaccid paralysis of the left upper and lower limbs and slight left lower facial weakness. This persisted for ten days, then he began to move the arm and in a few days the leg. During this stage of hemiplegia he was often drowsy, at times noisy and incontinent, and his temperature showed occasional rises to 102° F. Punctures of the left lateral ventricle and lumbar subarachnoid space were done at frequent intervals. When he could be tested it was found that he had a complete left homonymous hemianopia, a defect of postural sensibility in the left lower and to a less extent in the left upper limb, astereognosis and impairment of tactile localisation of the left hand. The disturbance of sensibility gradually decreased as did the hemiplegia, but the hemianopia remained, and doubtless because of its sudden onset, seriously interfered with his vision although visual acuity was considerably improved.

At the end of the fourth week after operation the drowsiness and incontinence had quite disappeared and his mentality was almost normal though his memory for recent events was still poor. He v[illegible]pital a week later. His headaches, [illegible] had entirely disappeared. The [illegible] was soft and no longer bulging.

After returning home he soon began to walk, and the left hemiplegia gradually disappeared, the last to recover being the left foot and ankle which for some weeks resembled a peroneal palsy. The impairment of postural sensibility persisted. Visual acuity was 6/18 in each eye, but there was complete left homonymous hemianopia, bisecting the macula, and he lost the place when reading. The visual disability was doubtless increased by the fact that there was scarcely any recovery of upward movement of the eyes. The pupils did not react to light and there was no convergence. Lateral conjugate movements were normal and ptosis had to a large extent disappeared. There was great improvement in hearing so that he could now hear whispers 8 ft. from each ear. In view of possible damage to the isthmus of the right limbic lobe from division of the right internal occipital vein it is of interest to record that smell at the right nostril was unimpaired.

During the next nine months he gained in weight and strength and apart from occasional slight giddiness when walking and occasional attacks of headache he remained free from discomfort. However, he was still unsteady in walking and had great difficulty in reading through losing the place, doubtless because of the hemianopia. No further recovery of ocular movements occurred. In June, 1931, nine months after operation, he began to go deaf once more, the cerebellar decompression became tense, and he became extremely unsteady in walking. X ray treatment was given by Dr. M. H. Jupe, but the full dose could not be administered as he would not keep still during treatment. However, he improved considerably until the end of July when he had a fall followed by unconsciousness. He went to the seaside and when seen again in September he was drowsy, apathetic, very deaf, and quite unable to walk. The cerebellar decompression was bulging and tense and he now showed nystagmus to the right. Further intensive X ray treatment was given under Nembutal anæsthesia. After this there was rapid improvement. Hearing became normal at each ear. He was able once more to walk by himself and he became alert and cheerful. The cerebellar decompression receded. When last seen on Dec. 7th, 1931, the improvement was being maintained under X ray treatment.

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† Temporary deviation of the eyes to the right after removal of the tumour occurred also in Foerster's case.

Comment.

The result of removal of this pineal tumour leaves much to be desired, but the progress of the patient after operation indicates clearly improvements that may be made in the management of future cases. This type of pineal tumour is evidently very susceptible to X ray treatment, and we would doubtless have obtained a better result from operation if we had given X ray treatment persistently both before and after operation as van Wagenen [20] did in his case. Our case shows some of the complications that may arise from this method of approach to the pineal region.

Hitherto very few pineal tumours appear to have been removed. Dandy [4] has removed two, Foerster [7] [8] and van Wagenen [20] have each removed one. Ernest Sachs [18] has also removed a cystic tumour from the pineal region. Cystic tumours of the pineal gland or quadrigeminal region have been evacuated by Pussep [16] and Foerster.[7] In these papers, with the important exceptions of those of Foerster and van Wagenen, no detailed account of the condition of patients that survived the operation is given. It is desirable that stigmata arising from the operation should be reported in order that attempts may be made to avoid them in the future.

Operative Problems.

From a study of the pathological reports of Hinds Howell,[10] Horrax and Bailey,[13] [14] Globus and Silbert,[9] and others, it is clear that in a considerable number of cases attempts to remove pineal tumours would not be likely to succeed. Some of the tumours are vascular and may invade the third or fourth ventricles, either directly or by implantation. Some spread in the subarachnoid space, thus encircling the brain stem, and in one of Globus and Silbert's cases the tumour had a large extension into the right lateral ventricle. In a few cases pineal tumour has been associated with another intracranial tumour, for example, glioma of the optic chiasm (Horrax and Bailey). But there are other pineal tumours which are circumscribed and relatively avascular and which, as Gordon Holmes [11] pointed out in 1910, lie more or less free on the quadrigeminal plate. With modern methods there should be a reasonably good chance of removing these tumours successfully. In other cases a cyst will be found. Probably about one-third of the tumours are of a type that is favourable to operation.

Various methods of surgical approach to the pineal region have been advocated. Krause [15] explored the pineal region along the upper surface of the cerebellum, but was unable to remove the tumour. The method attempted by Brunner ‡ and developed by Dandy [4] and Foerster appears to be superior to the others, and it was the method employed in this case. The posterior half of the right, or in special circumstances the left, hemisphere is exposed. Its venous attachments to the superior longitudinal sinus are divided, and the hemisphere is then retracted outwards so as to expose the splenium of the corpus callosum and the adjacent tentorium. Beneath these lies the tumour. The most difficult part of this operation has been the division of the veins passing into the superior longitudinal sinus without severe bleeding, but the use of endothermy, as advocated by Cushing,[3] renders this step relatively easy. In our case all the veins passing into the superior longitudinal sinus as far forward as the Rolandic fissure were divided, but we subsequently found that it was not necessary to go so far forward. The long axis of a pineal tumour and of the overlying corpus callosum and tentorium is not horizontal, as one is apt to think, but runs usually in an upward and forward direction. The region is best approached not from above, but from above and behind along the most posterior part of the medial surface of the cerebral hemisphere. We believe that the temporary hemiplegia that came on several hours after operation in our case was due to cerebral œdema from division of so many veins, and it would probably have been avoided had we spared the Rolandic vein (vein of Trolard).

Van Wagenen [20] has recently exposed and successfully removed a pineal tumour through the right lateral ventricle. An incision was made through the outer surface of the right cerebral hemisphere and the lateral ventricle was opened at the junction of its occipital and temporal horns. The tumour was then seen as a bulging area covered by the medial wall of the ventricle. This method of exposure would probably not have been effective in our case where the tumour was for the most part lying beneath the tentorium. In van Wagenen's case, as ventriculograms had shown, the tumour projected forwards into the third ventricle. The disturbance of function after operation in his case was the same as in our case—namely, contralateral hemiplegia and sensory loss, and permanent homonymous hemianopia.

Preservation of the vein of Galen is probably essential to life, for on its integrity depends the drainage of blood from the choroid plexuses and from the greater part of both hemispheres, with exception of the cortex. In removing a large pineal tumour Dandy [4] was forced to resect the large and small veins of Galen, and the patient died 48 hours later, though whether as a consequence of this step is not clear. In van Wagenen's case the tumour is figured as lying entirely above the vein of Galen and its tributaries. In Foerster's case the vein of Galen was displaced to the left. Our case in which the tumour lay below the vein of Galen and tela choroidea is probably the more usual type, since this is the normal relationship of the pineal gland and the vein.

A question of considerable importance in the treatment of pineal tumours is raised by the occurrence of left homonymous hemianopia as a result of operation. There was not in our case the slightest abrasion of the visual cortex or of any other part of the inner surface of the hemisphere, which was protected throughout the period of its retraction. The hemianopia was almost certainly due to division of the internal occipital vein, without which the tumour could not have been removed. Most anatomical text-books do not mention this vein, though it is figured by Charpy [2] in a diagram which we have modified to show the relationship of the vein to the pineal tumour in our case (Fig. II.). The internal occipital vein in our case appearing as a congeries of vessels covered by thickened arachnoid, has a short course from the internal surface of the hemisphere near the anterior end of the calcarine fissure to the vein of Galen, and in our case was lying above the tumour and preventing its exposure from above. We were fortunate enough to interest Prof. G. Elliot Smith in our suspicions as to the production of hemianopia by division of this vein and he and Dr. Una Fielding found by injection experiments that it drains the greater part of the area striata. In its course towards the vein of Galen it comes in close relationship with the under surface of the splenium and the tip of the pineal body. Save in the most anteriorly placed pineal tumours the problem of avoiding injury to this vein with resulting contralateral hemianopia is likely to be one of great difficulty.

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‡ Brunner's case is described by Rorschach.[17]

Diagnostic Problems.

It is not necessary here to recapitulate the signs of pineal tumour which are admirably described by Hinds Howell[10] and more recently by Foerster.[7] Our case shows that deafness resulting when the posterior quadrigeminal bodies are compressed by the tumour is not necessarily bilateral, as Horrax[12] suggested. Perhaps it would be more correct to say that the disturbance of hearing in the two cases may be so unequal that one ear may hear almost normally while the other is almost completely deaf. Sexual precocity occurs with some pineal tumours, particularly with *pineal teratomas in boys, and this has been described* by, Frankl-Hochwart,[10] Horrax and Bailey,[14] and others.

In an advanced case the clinical picture of a pineal tumour is fairly easy to recognise, but by that time the patient is usually almost or quite blind. The early cases are difficult to diagnose because at a time when papillœdema and other signs of hydrocephalus are already intense the only localising signs to be observed are slight ptosis and slight sluggishness of the pupillary reactions to light. The difficulty is increased by the fact that such partial ocular palsies are not always due to a lesion in the pineal region. In a case recently under the care of one of us these signs, together with impairment of upward movement of the eyes and signs of raised intracranial pressure, suggested strongly a pineal tumour, but operation disclosed an angeioma of the right lateral lobe of the cerebellum. Pineal and cerebellar tumours may simulate one another closely.

Dandy[5] claims that ptosis is the first sign and that "when ptosis is bilateral and without further involvement of the other muscular functions of the oculomotor nerves, the findings are practically pathognomonic of a tumour pressing down from the region of the corpora quadrigemina or pineal body." He also claims that localisation of pineal tumours is now relatively simple by ventriculography. This is evidently a promising field, but diagnosis by this means is scarcely as simple as Dandy's somewhat categorical statements suggest. The interpretation of ventriculograms of the third ventricle requires great experience, and even then may be difficult. Furthermore, it is unlikely, as Dandy affirms, that pineal tumours will always produce a filling defect of the third ventricle, for some of them grow backwards beneath the tentorium rather than forwards into the third ventricle. It may still be impossible after ventriculography to say whether the tumour is in the pineal region or is in the cerebellum. When we consider also that the use of air for localisation of tumours that produce intense hydrocephalus is not without its dangers and should be followed promptly by operation, it is doubtful whether ventriculography will really solve the problem of diagnosis in every case.

In a few cases pineal tumour has been associated with severe thirst, polyuria, obesity, and signs of pressure on the optic chiasm, thus simulating a tumour in the hypophyseal region. But the majority of cases simulate a cerebellar tumour and the main diagnostic problem in most cases will be whether to do a preliminary cerebellar exploration and to explore the pineal region later if no lesion of the posterior fossa is found, or whether to explore the pineal region at once. In our case, it will be recalled, considerable symptomatic improvement followed cerebellar decompression, and at the same time papillœdema subsided. When symptoms of hydrocephalus recurred and vision began to fail the signs of pressure on the quadrigeminal bodies were definite, and it was possible to localise the tumour accurately and to plan with deliberation an operation for its removal. Furthermore, we formed the impression that the cerebellar decompression acted as a valuable safety-valve during the stormy days that followed removal of the tumour.

It might be thought, therefore, that the right course to pursue in every case in which the diagnosis was not absolutely certain on clinical grounds would be to do a cerebellar exploration decompression and then to wait for some definite clinical signs before making a direct attack upon the tumour. In this connexion, however, it is important to note that four of Cushing's *cases, reported by Horrax and Bailey,*[13] [14] *died* at varying periods up to nine days after cerebellar decompression. The differences in effect of cerebellar decompression in pineal tumours are probably to be explained in part at least by the differences in size and in position of individual tumours in relation to the various parts of the mid-brain. After cerebellar decompression the tumour will tend to be displaced backwards. In tumours that have already expanded backwards beneath the tentorium this may relieve the pressure on the aqueduct of Sylvius and on adjacent structures. When the tumour has grown forwards into the third ventricle the effect of cerebellar decompression may be to produce increased pressure of the tumour against the aqueduct and quadrigeminal plate. Such shifting of the tumour will surely produce changes in the clinical picture and early exploration of the pineal region after a negative cerebellar exploration might still save the patient. The advantages that may come from careful neurological examination of patients with intracranial tumours after negative intracranial explorations have been pointed out in a previous paper (Cairns[1]). In the case now reported the localising signs of pineal tumour appeared almost immediately after cerebellar decompression.

Our conclusion is that diagnosis of pineal tumours and decisions as to the surgical procedure to be adopted in individual cases are still far from easy. In cases that are still doubtful after clinical examinations, or in early cases still doubtful after clinical examination and ventriculography, probably the best surgical procedure is a wide osteoplastic exposure of the cerebellum and posterior portions of the cerebral hemispheres. This can be effected by the type of operation that de Martel[6] uses for exploring the cerebellum, but the incision should extend further up towards the vertex. In this operation if no lesion is found in the posterior fossa it is possible to open the dura over the exposed right occipital lobe and thus to deal radically with any lesion of the pineal region.

Summary.

A youth, aged 20, with a history of four petit mal fits in four years complained of occasional giddiness on rising in the mornings and five months later began to have violent occipital headache. Papillœdema developed rapidly, and localising signs which were inconspicuous suggested a lesion of the posterior fossa or of the pineal gland. Cerebellar decompression was done seven months after the onset of symptoms without any tumour being found. There was rapid subsidence of papillœdema with preservation of good vision, but signs of disturbance of the superior corpora quadrigemina at once began to appear. He remained well for five months but then had another attack of hydrocephalus and signs of pressure on the inferior corpora quadrigemina. At operation an apparently circumscribed pineal tumour was removed, but only after division of the right internal occipital vein near its point of entry into the vein of Galen. After operation there was on the left side hemiplegia and sensory loss which gradually recovered, and left homonymous hemianopia which remained complete. There was relief from headache and from deafness, but great unsteadiness in walking and disturbance of vision, although visual acuity was only moderately impaired. Nine months after the tumour had been removed signs of recurrence became manifest. Under X ray treatment there was rapid improvement which was being maintained when the patient was last seen 13 months after the second operation, that is, two years and seven months after the onset of symptoms. Some problems of diagnosis and treatment of pineal tumours are discussed.

We desire to acknowledge and thank Dr. Dorothy S. Russell for the histological work in this case, and Prof. G. Elliot Smith and Dr. Una Fielding for their valuable help in the anatomical problems raised by this case. The expenses of publication were defrayed by the Charles Bingham Bolton Fund for neurology.

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RED CROSS BLOOD TRANSFUSION SERVICE.—The Duke of York, as chairman of the council of the British Red Cross Society, on Dec. 16th presented honorary life membership certificates and badges to Mr. and Mrs. P. L. Oliver in recognition of their work in organising and supervising the Red Cross Blood Transfusion Service. Sir Arthur Stanley recalled that the service began in 1921 as a result of a request for a blood donor received by the Camberwell division of the society, of which Mr. Oliver was then hon. secretary. Mr. Oliver formed a circle of Red Cross members to try to meet the demand, and in 1924 this had increased so much that he had to appeal for outside volunteers. The London Blood Transfusion Service was then formed, with Mr. Oliver as hon. secretary, and since then the service had steadily grown, having now more than 1300 donors on its books. So far, 1980 donors had been supplied during 1931. Mr. Oliver's office, said Sir Arthur, was open night and day, and his telephone has only once been left unattended—during a change of administration in 1926—in the 11 years the service had been in existence.

EARLY DIAGNOSIS OF WHOOPING-COUGH BY THE COUGH-DROPLET METHOD.

WITH A NOTE ON VACCINES AND THEIR USE.

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WHOOPING-COUGH is often regarded as an unimportant disease, and few seem to realise that, as a killer of children, it is at least equal to measles, or to diphtheria and scarlet fever put together. In the Registrar-General's Statistical Review we find that the average annual death-rates per 1,000,000 persons living under the age of 15 during the period 1920 to 1929 were: for whooping-cough, 456; for measles, 440; for diphtheria, 322; and for scarlet fever, 79.

Science has hitherto given the physician little help in his management of the disease; the diagnosis usually has to be made by the mother or nurse, and treatment is merely palliative. The aid of bacteriology in diagnosis is rarely called upon, because neither the medical profession as a whole nor laymen, such as heads of schools, with children in their care, know what valuable advances in our knowledge of this subject have been made in recent years.

Now we, like most bacteriologists, were aware that a bacteriological diagnostic method had been successfully practised in Denmark for some years, and early in 1929 we decided to put it to a thorough test with the aim of assisting its introduction into this country. Soon after we had begun our work, a paper on the subject was published by Sugare and McLeod (1929), which partly covers the same ground. We shall refer to this again later.

The Causative Agent.—There is no longer any room for doubt that the bacillus of Bordet and Gengou (1907), or, in modern terminology, *Hæmophilus pertussis*, is the true and sole cause of whooping-cough. In the catarrhal bronchial exudate of persons who sooner or later develop typical symptoms it is invariably present; in catarrhal states unconnected with whooping-cough, never. We believe that these statements are not too strong, although the proportion of cases in which it is practicable to demonstrate the bacterium must always fall short of 100 per cent., and in spite of the fact that it has been found in the throats of two children not evidently suffering from whooping-cough (Fränkel, 1908). The blood-serum of whooping-cough patients constantly contains substances which fix complement specifically with suspensions of *H. pertussis*. In other infections the reaction is negative.

These proofs of its causative rôle have been completed by the transmission of the disease to monkeys with pure cultures of the micro-organism (Fränkel, 1908; Inaba, 1912; Sauer and Hambrecht, 1929). Mallory and Horner (1912) showed that in dead human subjects the bacterium grows on the ciliated epithelium of the trachea and bronchi, and Sauer and Hambrecht (1929) have given a clear demonstration of the resulting endobronchial and peribronchial lesions. *H. pertussis* may be recovered, sometimes in pure culture, from broncho-pneumonic patches in the lungs.

Bacteriological Diagnosis.

Previous Work.—The pioneer researches of the Danes, based upon the discovery of *H. pertussis* by

Bordet and Gengou in 1906, are well summarised by Madsen (1924), and will be mentioned again. In America Lawson and Muller (1927) and Sauer and Hambrecht (1930) have made good use of the diagnostic method, which has also proved very serviceable in France in the hands of Debré, Marie, and Pretet (1929).

When we began our work there was, so far as we know, no British publication on the subject, but shortly afterwards, as we have already mentioned, a paper was published by Sugare and Macleod (1929) who, in spite of using the sputum-plating method, which had been discarded as unsatisfactory by the Danes, isolated the bacterium in all of their five cases in the catarrhal stage. Their paper incidentally contains valuable confirmatory evidence of the invariable absence of *H. pertussis* in catarrhal conditions other than whooping-cough.

The Culture Medium.—We have used the Danish modification of the original Bordet-Gengou medium, altered in a few respects. It is made as follows:—

Potatoes are cleaned and cut into thin slices: 1 kg. of the slices with 2 litres of distilled water and 80 c.cm. of glycerin are boiled until the potatoes are soft. The water lost in the boiling is made up and the whole filtered through linen. The juice is then adjusted to pH 7·0. One part of the neutralised juice and three parts of 0·6 per cent. NaCl are mixed and distributed in flasks, 200 c.cm. in each; 4 per cent. agar is added, and the flasks are left in the cold store overnight. The medium is then autoclaved and to every 200 c.cm. are added 4·5 c.cm. of a sterile N/2 solution of lactic acid (3·72 c.cm. of ac. lact. of sp. gr., 1·21 to 100 c.cm. aq. dest.). When the flasks have been cooled to 45°–50° C., 100 c.cm. of fresh defibrinated horse's blood is added to each. The medium is then mixed well and poured into Petri dishes. It will keep good for a fortnight in the cold store.

COUGH-DROPLET METHOD.

As soon as the earliest suspicion of whooping-cough arises, the doctor obtains from the laboratory two or three Petri dishes of the special culture-medium, and instructs the parent or nurse to carry out the following directions, which are sent out with the culture-medium.

> "When a *natural attack* of coughing starts, remove the glass lid of one of the dishes and, holding the dish about six inches away, allow the patient to cough for about 10–15 seconds on to the surface of the red jelly. No sputum (phlegm) must be coughed on to the surface, otherwise the plate will be spoilt. The *invisible* cough droplets are quite sufficient. Replace the lid at once. Do the same with each of the dishes provided. If the patient has no long attacks, but only a short, sharp cough occasionally, use each dish three or four times. Artificial coughs, done on purpose, are useless. Keep the dishes in a cool, dark place when not in use, and return them as soon as possible to the laboratory."

If necessary, the dishes may be sent out and returned by post. In Denmark it has been found necessary to use metal (aluminium) dishes to avoid breakage. We have found glass ones of about 2¼ in. diameter satisfactory for local use. After the speediest possible return to the laboratory, the dishes are incubated at 37° for about 72 hours, being examined each day to see that the sowing has been satisfactorily done. Any spreading colonies that may spoil the result are cut out of the medium. In about 48 hours *H. pertussis* begins to appear in the form of minute glistening colonies, but 72 hours (occasionally even four days) are required before they can be recognised with any certainty. A watchmaker's lens, which can be held in the eye, is an important aid, and we have found oblique illumination with a dark-shaded lamp preferable to daylight. The fully developed colony is about 0·5 mm. across and has a characteristic sheen, like a tiny pearl or a droplet of mercury. Zones of whitening or of clearing round the colonies, such as are sometimes described, are in our experience inconstant when the growth is young, though ageing growth always whitens the medium at a certain stage. A platinum needle easily enters the colony and picks up part of its moist substance.

IDENTIFICATION OF ORGANISM.

The typical appearance of the colonies nearly always differentiates them from those of any other organism; but sometimes, owing to the dryness of the medium or to delayed development, the colonies appear dry, whitish, and wrinkled, and considerable doubt may arise as to their identity. As a routine, therefore, when films are made from any suspicious colony, a subculture is made on fresh Bordet medium. In the case of *H. pertussis* the mass-growth is dry, roughish, and circumscribed, resembling a streak of aluminium paint. Films are stained by Gram's method, with diluted carbol-fuchsin as counterstain. *H. pertussis* appears as a small ovoid Gram-negative rod or cocco-bacillus, frequently paired, like a tiny pneumococcus. The common allegation of "bipolar staining" seems to be based on a misinterpretation of these paired forms, and it should be omitted from future descriptions of the organism. *H. influenzæ* may be distinguished from *H. pertussis* by the fact that the colonies of the former organism appear after 24 hours' incubation. They are flat and transparent, and slide over the surface of the medium when touched with a platinum needle. Subcultured on Bordet's medium they give rise to a moist, transparent, and spreading growth.

Agglutination.—Although the combination of colony appearance and cell form makes the identification of *H. pertussis* certain enough for practical purposes, we have verified all our identifications with the agglutination test.

Agglutination Test.—From the primary streak of a colony subcultures are made by smearing the growth all over the surface of one or more large dishes of Bordet's medium. After 48 hours at 37° C., the growth is scraped off and emulsified in saline solution containing 0·2 per cent. of formalin, by rubbing up in an agate mortar. After dilution to a suitable density (equal to a suspension of some 600 million per c.cm. of *Bact. typhosum*), the suspension is tested by Dreyer's method with a specific agglutinating serum, in dilutions ranging from 1 in 50 to 1 in 500 or more.

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TREATMENT OF ACUTE LOBAR PNEUMONIA BY ARTIFICIAL PNEUMOTHORAX.

BY J. J. COGHLAN, M.R.C.S. ENG.,
LATE ASSISTANT MEDICAL OFFICER, ST. OLAVE'S HOSPITAL, LONDON, S.E.

DURING an investigation into lobar pneumonia it was discovered that the induction of artificial pneumothorax had a favourable influence on the progress of this disease. In view of the arrival of winter, with its attendant respiratory infections, the following cases are reported in order to give an idea of the results which may be obtained, and to allow others to test the method.

Although a full account of the theory and rationale of this treatment will be published later, it may be briefly stated here that the induction of artificial pneumothorax on the affected side, according to the technique described, has the advantage that it (1) separates the inflamed pleural surfaces, relieves pain, and allows of easy respiration; (2) puts the inflamed lung at rest; and (3) limits the flow of blood through the pneumonic lung, thereby diminishing anoxæmia, and interfering with the passage of toxins into the general circulation.

In observing the results it is well to chart respiration-rate as well as temperature because, as will be seen, these curves are of great value in following the course of the disease, and in assessing the effects of treatment. In fact, they form a very accurate guide on which to base treatment.

Case Records.

The following are brief reports of six cases.

CASE 1.—Male, aged 20. Admitted to hospital at midnight on June 21st, 1931. Right lobar pneumonia, fourth day of disease.

On admission the temperature, pulse-rate, and respiration-rate readings were: T. 102° F., P. 96, R. 32. These figures rose till, at 2 P.M. on June 22nd, they stood at T. 102·4°, P. 124, R. 46. Examination showed solidification of right middle and lower lobes. At 2 P.M. artificial pneumothorax was induced on affected side. In spite of preliminary medication with morph. gr. ¼, the pleura was found to be intensely hyperæsthetic—a feature common to all the cases dealt with—rendering necessary very complete local anæsthesia before the patient would tolerate the passage of the artificial pneumothorax needle.

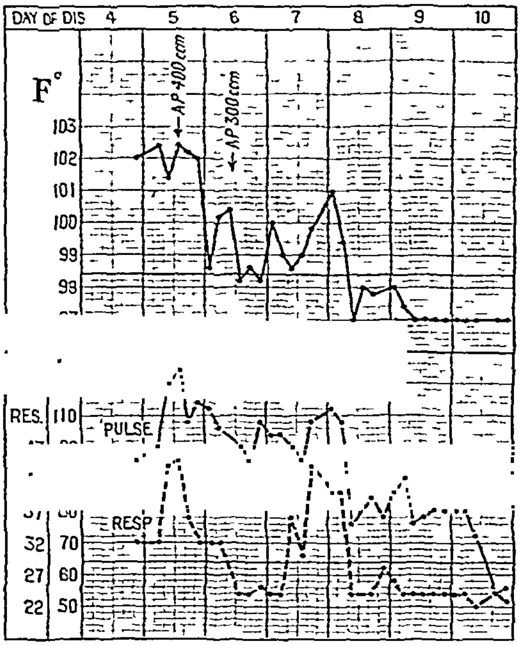
On entering the pleural cavity, a second feature common to all the cases was encountered—namely, the extremely wide and irregular variation of the intrapleural pressure as measured on the manometer, −40 to +40 being quite a normal swing. These pressures were not perceptibly altered as the air entered and, consequently, the manometer could not be used as a gauge to check the filling in these cases, as it can in pulmonary tuberculosis. There was no difficulty in inducing the pneumothorax; the air, which was admitted very slowly, entered easily, and the pneumonic lung fell away from the chest wall and collapsed quite readily; 400 c.cm. of air were used on the first fill. The therapeutic results were immediate and obvious; the patient, who until then had had the usual hot, dry skin of pneumonia, began to perspire freely; cyanosis and dyspnœa were both diminished, thoracic pain disappeared, and the patient "felt much better." Profuse perspiration continued, and by 2 A.M. on June 23rd the chart readings had fallen to T. 98 6°, P. 112, R. 32. The patient was very comfortable and looked as if he had just negotiated the crisis.

From this point the picture changed again. Perspiration ceased, the skin becoming hot and dry, and the temperature rose steadily, reaching T. 100·4°, with P. 106, R. 32, at 10 A.M. on the 23rd. As it was obvious that the patient was rapidly reverting to a condition of acute pneumonia, the pleura was again punctured. It was now discovered (again a feature common to all the cases) that the absorption-rate of the inflamed pleura was abnormally high: the 400 c.cm. of air admitted 20 hours previously had been completely absorbed, and the lung was again in contact with the chest wall. 300 c.cm. of air were admitted, and the procedure was followed at once by profuse perspiration and clinical improvement. In four hours, at 2 P.M., the chart readings were T. 98·2°, P. 100, R. 24. From this point, although there were two transient temperature rises, to 100° at 2 A.M. on June 24th and to 101° at 2 A.M. on the 25th, as the temperature fell away immediately afterwards of its own accord to normal in each case, and as the patient was obviously well clinically, no more air was admitted.

From 2 A.M. on June 25th the chart readings steadied at an average value of T. 97°, P. 80, R. 22; the patient made an uneventful convalescence, left the hospital in good health, and was seen, quite well, three months later on return from a convalescent home.

A radiogram of the thorax taken on June 30th, five days after the final settling of temperature, shows: (*a*) a small residual collapse in the apical region; (*b*) resolution of the right lung nearly complete; (*c*) no evidence of fluid effusion.

FIG. 1 (Case 1).



This rapid resolution appeared to be a feature of all the cases.

CASE 2.—Female, aged 9. Admitted 8.30 P.M. June 20th. Right lobar pneumonia, second day of disease. On admission, chart readings were T. 103°, P. 128, R. 30. Right lung solid from base to apex.

As will be seen from Fig. 2, during the first three days in hospital this child ran an evening temperature of 103° to 104°. By midday on the fourth day she was semi-comatose and was not expected to survive the night. Although it had originally been intended to exclude children, this child was so obviously dying that, in view of the encouraging results already obtained, artificial pneumothorax was induced at 5.30 on the 23rd, 150 c.cm. of air being admitted. The same phenomenon of wide variation of intrapleural pressure was noted as in the previous case, and the lung collapsed quite as readily. The child was too ill to object in any way to the operation. Profuse perspiration set in at once; at 6 P.M. the chart readings had fallen to T. 100 2°, P. 120, R. 28; at 10 P.M. the temperature was normal. The child passed a comfortable night, the chart readings next day being:—

	Temperature.	Pulse.	Respiration.
6 A.M.	101·8°	104	24
10 A.M.	96·8°	100	19
2 P.M.	100·2°	106	22
6 P.M.	97°	96	28

Since the clinical improvement, as can be gathered from the above figures, was very marked, and as nothing was then known of the rapid absorption of air in these cases, no further refill was given on this day. Next morning the pneumonia was returning, the 6 A.M. chart readings being T. 102°, P. 112, R. 32, and by evening was fully re-established, of the disease. It seems, however, that such cases are rare, and that healthy carriers play a minor part in the spread of the illness. It is in the undiagnosed early catarrhal state that most of the damage is done.

ADVANTAGES AND DISADVANTAGES OF THE TEST.

Advantages.—(1) Unlike many laboratory tests, such as the Widal and Wassermann reactions, it is at its best at the very beginning of the illness, before symptomatic diagnosis is possible. (2) No drawing of blood or other painful or time-consuming operations are necessary. (3) When positive it gives complete certainty.

Disadvantages.—(1) It takes three days. Meanwhile the diagnosis may sometimes be made on clinical grounds. (2) Single tests fail in about 25 per cent. of cases owing to faulty management by mother or nurse. (But repetitions will usually succeed.) (3) The culture medium deteriorates rather quickly, and must be made every fortnight. (4) A horse and a *refrigorator are necessary for large-scale work.* [The former may, however, be borrowed for an hour fortnightly at a small fee. Small batches of medium can be made with human or rabbit blood.]

In spite of these disadvantages we have found the test to be of great assistance to doctors; and when, in the future, the State becomes interested in the not inconsiderable number of babies' lives and the innumerable hours of school lost through this disease the aid of bacteriology will necessarily be called on to the fullest degree. Meanwhile, it would prove a boon to a large and increasing number of progressive practitioners if bacteriologists at central laboratories would master the method and make it available for general use. We are convinced that public health authorities would find it well worth while to make use of, and if necessary to pay for such a ready help towards the early diagnosis and consequent limitation of school epidemics.

Use of Specific Vaccines in Prevention and Cure.

It is difficult to give a useful opinion on the value of vaccines in the treatment of whooping-cough, for there are no data suitable for statistical analysis. But if there is a specific element in the vaccine treatment of infectious diseases in general; if, that is to say, the acceleration of the healing processes of nature, which often, though irregularly, follows the injection of vaccines, is not entirely due to non-specific "protein shock," then we can predict that the results in whooping-cough will be greatly improved by using a vaccine that contains the chief antigen of the virulent, parasitic phase of *H. pertussis*. In England and the U.S.A. the vaccines in general use have usually been innocent of this necessary ingredient (Leslie and Gardner, 1931). We are in a position to state that the vaccine now being produced by the inoculation department at St. Mary's Hospital, and sold by Parke, Davis and Co., is of the quality desired.

Of much greater public importance is the problem of raising individual and herd immunity against *H. pertussis*. A review of the work done on these lines has been given by Madsen (1924). Most of the reports are strongly favourable, and in discussing the Danish work Madsen says that "although no absolutely sure prophylactic effect has been obtained . . . there is no doubt that infection is lighter among the vaccinated than among the non-vaccinated." Since we know that the cultures from which the vaccines are made at the State Serum Institute in Copenhagen are propagated on fresh blood medium, on which the original toxic and immunity-producing component of the organism is preserved, the Danish experiences are especially deserving of respect. In a large epidemic in the Faroe Islands in 1923 the mortality *among vaccinated patients was only one-twelfth* of that among the non-vaccinated. It seems that the duration of the immunity is short, and that its maximum effect is within a week or so of the final injection. Madsen recommends three subcutaneous or intramuscular doses of 0·5 c.cm., 0·7 c.cm., and 1·0 c.cm. of a suspension in saline solution + 0·5 per cent. phenol of about 10,000,000 bacteria to the c.cm. In our experiments on animals (loc. cit.) we made use of the well-known detoxicating effect of formalin by killing our vaccines with 0·2 per cent. of that substance and storing in the cold for at least a week before use. The highly poisonous endotoxin of the bacillus is well neutralised in this way.

Theissier, Reilly, Rivalier, and Cambassédes (1929), working with endotoxin extracted from the bacilli *and treated with 3 per cent. formalin,* were *unable* to produce detectable protective substances in the blood of human beings, or any curative effect in the established disease. But their formalised endotoxin, though harmless and highly protective to animals, produced such a sharp reaction in the human subject that only very small doses could be given (one wonders whether the very high concentration of formalin may have been to blame). With whole bacilli treated with formalin no protection of animals could be effected.

Finally, it may be mentioned that complement-fixing antibodies are produced in normal human beings by the injection of vaccines of *H. pertussis* (Kristensen, quoted by Madsen), just as they are in infected subjects by the living microbe.

Thus the evidence on the value of preventive vaccination is conflicting, but the Danish experiences are promising enough to make a more extended trial of the method desirable.

Summary.

The bacteriological method of diagnosis of whooping-cough and the results of more than 100 tests of suspected persons, compared with the experiences of foreign workers, show that in the early stages of the disease at least three out of four cases can be detected by a single examination. The fourth eludes detection only because of human fallibility. Reasons are given for the final acceptance of *Hæmophilus pertussis* as the cause of whooping-cough, and the desirability of using antigenically efficient cultures in the manufacture of vaccines is emphasised.

Our thanks are due to the medical practitioners who have supplied us with material and to the Medical Research Council, who have given financial *assistance.*

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can be attributed to error of judgment in a difficult situation and lack of knowledge of the technique, owing to inexperience, rather than to a defect in the method of treatment itself, for it was obvious that the pneumonic process was as well controlled by the artificial pneumothorax in this instance as in the previous cases. Unfortunately no autopsy could be obtained.

CASE 5.—Male, aged 25. Admitted 6 P.M. on Oct. 3rd. Solidification of right lower lobe, first day of disease. On admission the chart readings were T. 101°, P. 128, R. 38.

The patient had had several previous attacks of pneumonia, and came into hospital on the first day of the disease. He was kept under observation till 6 P.M. on the 5th, by which time the diagnosis was fully confirmed, and solidification of the right lower and mid-zones well established. Chart readings T. 105°, P. 124, R 32.

This case is of interest as being the one case of the series in which the pneumonia was not cured by artificial pneumothorax, and, consequently, furnishes data which could not be obtained from the others.

Artificial pneumothorax was induced at 6 P.M. on the 5th. The patient was of a highly nervous, resistive type, and groaned and moved violently during the operation, and owing to non-cooperation on his part, it was only possible to admit 250 c cm of air. Crisis was at once established, and the patient perspired well In two hours' time the chart readings had fallen to T. 99 8°, P. 100, R. 22, and in four hours to T. 98°, P. 88, R. 20. The small quantity of air admitted was rapidly absorbed, and by 2 P.M. next day the figures were T. 104·4°, P. 112, R. 28. Here another attempt at induction was made. The patient, however, was so antagonistic that after only 100 c.cm. of air, at most, had entered, he displaced the needle from the pleural cavity by his violent movements, and from this time on refused any further treatment. As the result of this small refill the chart readings again fell steadily to T. 100 4°, P. 100, R. 28, which figures were reached at 10 o'clock the same evening. The air was soon absorbed, the pneumonia became fully re established, and remained so for seven full days, when the normal crisis occurred

FIG. 4 (Case 5).

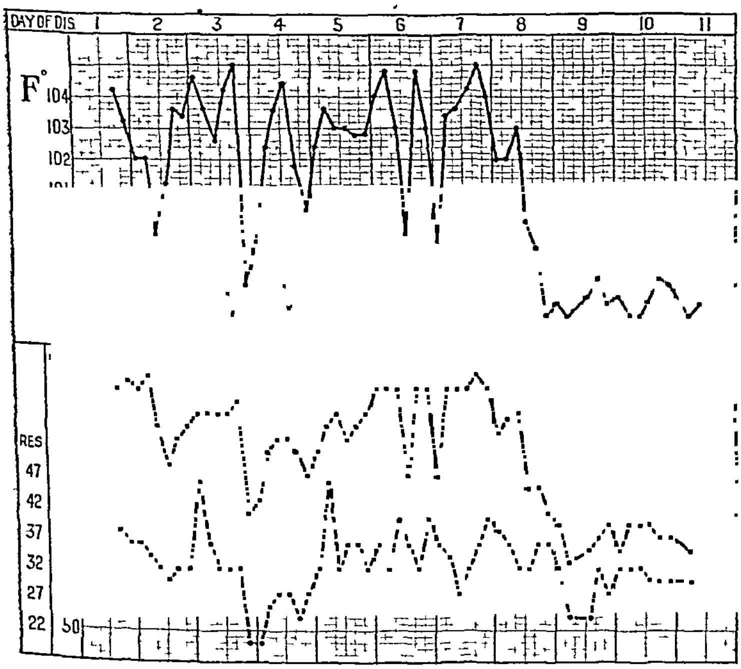
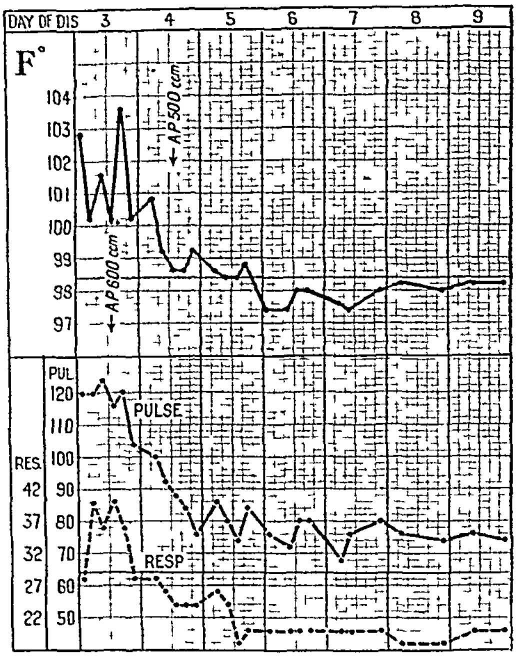


FIG. 5 (Case 6).



This case is instructive because it fully meets the objection that the crises produced in the previous cases were not due to the artificial pneumothorax, but were merely accidental coincidences of the normal crisis with the induction. In this case a crisis was produced on the third day of the disease; as soon as the air was absorbed the disease returned, and the natural crisis did not occur for a further seven days. This, taken in conjunction with the previous results, makes it impossible to come to any other conclusion than that artificial pneumothorax induces a crisis, and that this is due to the presence of air in the pleural cavity and ceases when the air is absorbed.

CASE 6—Male, aged 23. Admitted 2 A.M. on Nov. 6th. Right lobar pneumonia, third day of disease.

On admission, chart readings were T. 102 8°, P. 120, R. 23. Examination showed solidification of right lower and middle lobes.

This was the most successful case of the series from the clinical standpoint, for by now it was fairly clear what the correct technique should be, and the necessity for two fills at short intervals was fully recognised. As a consequence, the patient received 600 c cm. at 2 P.M. on the 6th and 500 c.cm. at 2 P.M. on the 7th. At 2 P.M. on the 7th, before the second fill was given, the chart readings were T. 98 6°, P. 88, R. 24, and from this point convalescence was uneventful. On giving the second fill, it was again noticed that almost all the air had been absorbed, and three radiograms showed that absorption of the pneumothorax was completed in less than a week, and that resolution occurred as rapidly as before.

In order to establish as thoroughly as possible the identity of the artificial crisis with the natural one, estimate was made in this case of the urinary chlorides and the white blood count before and after the defervescence produced by the pneumothorax.

Nov. 6th. Urinary chlorides—400 mg. per cent. W.B C. 19,200.

Nov. 7th. Urinary chlorides—640 mg. per cent. W.B.C. 14,200.

the 6 P.M. chart readings being T. 103·6°, P. 134, R. 40. A second fill of 100 c.cm. was accordingly given.

The crisis again set in rapidly: at 6 A.M. next day the chart readings had fallen to T. 101°, P. 110, R. 34. By evening they were T. 97·6°, P. 116, R. 32, and by next morning T. 97°, P. 80, R. 28. From this point convalescence was uneventful and the lung resolved as rapidly as in the previous case. The child went to a convalescent home in good health, and returned some months later, perfectly well.

CASE 3.—Male, aged 32. Admitted at 6 P.M. on Sept. 15th. Left lobar pneumonia, third day of disease.

On admission the chart readings were T. 101·6°, P. 112, R. 32. Examination showed solidification of the left lower lobe.

Since the question of the best technique to be adopted both as to size and frequency of refills could only be solved by experiment, this patient was only given 250 c.cm. at his first fill, which took place at 7 P.M. The skin immediately became moist, and the patient passed a very comfortable night, sleeping most of the time, but the amount of perspiration was slight as compared with the two previous cases. At 6 next morning the chart readings were T. 100°, P. 100, R. 32, which rose to T. 101·2°, P. 104, R. 36 at 10 A.M. A second refill of 200 c.cm. was now given. Perspiration set in freely, the temperature falling by 12 noon to 99·8°. It rose again at 6 P.M. to 101·2°, but as the patient was perspiring freely and feeling well, nothing further was done, and the rates steadily fell until by 6 A.M. the figures were T. 97·6°, P. 100, R. 32. During this day the chart readings rose suddenly at 12 noon to T. 100·8°, P. 104, R. 32, but immediately fell away, and by 4 P.M. were T. 98·4°, P. 86, R. 32, from which point it remained normal. The fills in this patient (250 and 200 c.cm.) were evidently too small to control the pneumonic process properly.

A radiogram taken on Sept. 21st, six days after admission, showed a small residual pneumothorax in the left basal region, and resolution of the left lower lobe advancing nicely. The right lung, however, showed extensive mottling and increase of root shadows (? old tuberculosis), and the patient gave a history of pneumonia in childhood. Old lesions may have contributed, along with the small fills given, to the comparative slowness of the response to treatment in this case, for on three separate occasions during the next month, while under observation in the ward, this patient showed an evening temperature of 99°, following exertion during the day. However, nothing could be detected clinically, the temperature was normal during the rest of his stay (although he was up all day), and he was discharged to a convalescent home, apparently well.

FIG 2 (Case 2).

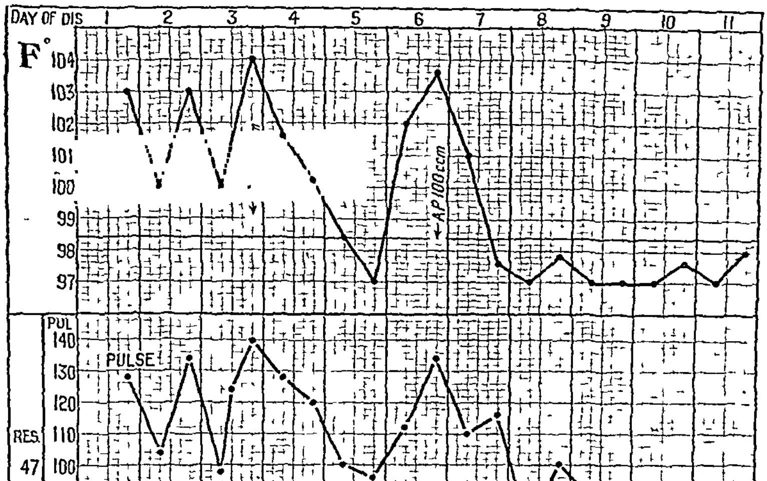
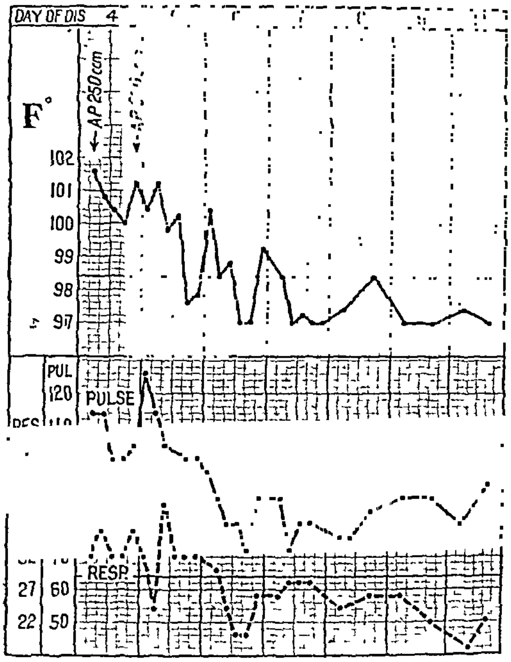


FIG. 3 (Case 3).



Radiography on Dec. 10th, however, showed very obvious fibrotic changes in the right lung, and as there seemed a definite increase in the shadows at the right base, the sputum was again tested, and two consecutive specimens proved positive for tubercle bacilli. The patient protested that he felt perfectly fit, and nothing could be detected by the stethoscope.

CASE 4.—Male, aged 55. Admitted 12.30 P.M., Sept. 18th. This patient, an elderly, poorly nourished man, had been ill at home for several days. On admission his condition was very bad, the chart readings being T. 99·8°, P. 132, R. 36. He was intensely cyanosed, the pulse was feeble, and the cardiac condition very poor. There was extensive solidification of the left middle and basal zones. In addition, there was a past history of chronic bronchitis, and the right lung showed evidence of emphysema and basal congestion.

A difficult point at once came up for decision. Granting the pneumonic process could be controlled by pneumothorax, would it be better for the damaged heart to aim at an immediate and complete crisis by a large fill, thereby bringing the toxic process to a stop, and risking the strain on the right ventricle caused by the resulting embarrassment of the pulmonary circulation, or to aim at a fall by lysis by a series of very small fills, thereby avoiding the immediate strain but exposing the heart to a further 36–48 hours of toxæmia? The first course was ultimately adopted. The patient was given insulin and glucose with the idea of improving the nutritive reserves of the myocardium by the deposition of glycogen, and after allowing half an hour for this to be absorbed, was prepared by morphine and strychnine, and 750 c.cm. of air was admitted to the left pleural cavity. A very violent crisis set in; the patient perspired profusely, the cyanosis became markedly diminished, and the patient felt much better. The improvement continued till 10 P.M., the temperature then being 99° and the pulse 100. Here, however, the pulse began to rise, and signs of failure of the right ventricle appeared. The patient was given the usual cardiac stimulants and revived temporarily, but the right ventricle failure increased progressively, acute œdema of the contra-lateral lung appeared at 4 P.M., and the patient died at 6 A.M.

This case was the only fatal one of the series. It air, run in very slowly during the negative phase of the pressure swing cycle, and with the needle clipped off during the high positive phases. (5) A second fill 12 hours later of 300–500 c.cm. of air. (6) If the pneumonic process is not completely controlled, a third fill of 100–150 c.cm. of air may be given in another 12 or 18 hours. (7) Simultaneous exhibition of a suitable diaphoretic and of Felton's serum in appropriate cases at the discretion of the operator. (8) Owing to the very profuse perspiration, the comfort of the patient is much enhanced by warm sponging p.r.n. and nursing between blankets. (9) In cases where it is deemed inadvisable to provoke defervescence by crisis, and a gradual fall by lysis is aimed at, three fills of 100–150 c.cm. at intervals of six hours might be given and further treatment judged by results.

No special points with regard to *after-treatment* were noted. Patients 1 and 3 were given blow-bottles with the idea of promoting re-expansion of the lung and absorption of any residual air, but this did not seem to be really necessary or to be of any particular advantage.

Finally, lobar pneumonia is emphatically not the disease on which to gain a knowledge of the technique of artificial pneumothorax.

I am indebted to Dr. R. Kelson Ford, medical superintendent of St. Olave's Hospital, for permission to publish these cases, and I also wish to express my thanks to my colleague, Dr. M. S. Purvis, for kindly undertaking the treatment and care of these patients in his wards.

THE INJECTION TREATMENT OF HÆMORRHOIDS.

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Because of man's upright position and mode of life under modern civilised conditions, his venous system is subject to much stress, and it is not surprising that disease of this system is extremely common. The modern treatment of varicose veins and of piles has made their prevalence more apparent. There is now no doubt that the injection treatment of piles has largely replaced the operative treatment. There is also no doubt that many with insufficient knowledge and very inadequate equipment are practising this method with a certain amount of success. Their complications are many, their results are only temporary, and they are bringing discredit on a very efficient form of treatment.

For all practical purposes uncomplicated piles produce few symptoms. Bleeding is the commonest, and usually the first; it occurs during defæcation, and the blood is bright red. The second commonest symptom is prolapse. In its early stages prolapse may occur during defæcation, and either reduces spontaneously or is easily reduced by pressure. With the continuation of prolapse, the external sphincter loses its tone and protrusion of the piles is effected with less and less force until a stage is reached when the piles prolapse during slight exertion. Finally they may remain chronically prolapsed. As the prolapse becomes more marked the mucous membrane becomes thickened and the tendency to bleed becomes less. The third symptom is the discharge of mucus. This is a late symptom, and is the result of frequent or chronic prolapse. Piles may cause a feeling of fullness in the rectum, but pain is not a symptom of uncomplicated piles, except while they are prolapsed.

Three things must be done before arriving at a diagnosis of piles. First, the anal region must be inspected; secondly, the rectum must be examined with the finger; thirdly, the rectum must be inspected with an efficient proctoscope. In certain cases this must be followed by sigmoidoscopy and X ray examination of the colon before a complete diagnosis can be made.

Treatment.

Before advising treatment for piles it is necessary to make a general examination of the patient. Faults in living and in diet can be corrected, and those cases where the piles are due to cardiac or hepatic conditions or are associated with abdominal tumours or prolapse of the uterus can be discovered. Unless the underlying cause in these cases is recognised at the beginning, much disappointment will follow any form of treatment. Having excluded the cases that have an obvious general or local cause, it is necessary to decide the stage of development the piles have reached, and also if there are any complications. As a rule, complications must be treated first.

OPERATIVE TREATMENT.

In long-standing cases, especially where attacks of thrombosis have occurred, the piles become fibrotic or polypoid. The more fibrotic the piles, the less suitable they are for injection treatment. Polypoid piles can be treated only by operation. Where there is a single large fibroid polyp, and the remaining piles are suitable for treatment by injections, the polyp can easily be removed under local anæsthesia and the injections commenced a week later. External piles can be treated only by operation. The proportion of patients suffering from piles that will need operative treatment will depend on the surgeon's experience with the injection treatment. With a wide knowledge of modern injection methods 80 per cent. of cases can be treated in this way.

INJECTION TREATMENT.

The treatment is ambulatory. It requires much more practice, time, and patience than other forms of injection treatment. Unless the necessary instruments are available, and are in good working order, the treatment becomes farcical.

The following *instruments* are necessary:—

1. A suitable *rectal speculum*. Since good illumination is essential, a speculum fitted with a light should be considered. The Cameron lighted rectal instrument and an illuminated rectal speculum made for me by Down Bros. are two that meet the requirements.

2. A *graduated syringe*. The Morley type of syringe is very satisfactory.

3. Suitable *needles*. The needles can be a great source of annoyance, and, owing to the effect of the solution used, show a tendency to become blocked. Down Bros. make for me a straight needle, five and a half inches in length, with wide bore as far as the terminal portion. The terminal portion is of the usual bore, made of nickel, and fitted with a guard. There is a bayonet catch on the syringe to prevent the needles slipping off. When the needles become blocked, it is not sufficient to pass a stylette; this merely presses the particles to one side and the needle quickly becomes blocked again. Screw the guard on as far as possible, reverse the needle, insert the nickel or gold portion in the nozzle of the syringe, and forcibly squirt water from the syringe. Some

There was thus a rise in the urinary chlorides of 60 per cent. and a fall in the leucocyte count of over 25 per cent. in less than 24 hours after the induction of the pneumothorax, a fact very difficult to explain if the mechanism of the defervescence due to artificial pneumothorax and the natural crises were not essentially similar phenomena.

A point of interest is that the radiograms of these cases showed that acute pneumonia possesses the typical distribution of a disease spread by the bronchi with the usual predilection for the right middle zone. This rules out the suggestion that the disease is a septicæmia with local manifestations, or that the lung is infected from the blood stream.

Practical Considerations.

From the experience gained from these six cases, it is possible to draw certain conclusions as to the therapeutic results obtainable, and also as to the technique to be adopted to get the best results. These, of course, are only advanced tentatively at present.

The first and most obvious clinical result was that the induction of artificial pneumothorax initiated a series of events almost indistinguishable from the crisis which normally occurs in this disease. It is true that there were certain minor variations noted, but these do not affect the practical result.

The second conclusion is that this control of the pneumonic process is at first only temporary, persisting merely as long as air remains in the pleural cavity. Since the absorptive capacity of the pleura in this disease is abnormally high—a factor which had not been suspected at the beginning of these investigations—the time taken to absorb the air is a matter of hours only, after which the pneumonic process becomes re-established at its original level. By adequate refills, however, this return of the disease can be forestalled, and when the artificial pneumothorax control has been maintained for a sufficient length of time (48 hours appears to be approximately correct) the pathological process is definitely brought to an end, the air can be absorbed without any tendency to relapse, and convalescence proceeds normally. Resolution in the successful cases occurred more rapidly than usual, probably because, as the time of the disease was shortened, there was less damage done to the lungs and less exudate formed in the alveoli than if the pneumonia had been allowed to run its full course to a natural crisis.

A striking feature of all the cases was the rapidity of the onset of the artificial crisis; profuse perspiration set in almost as the pneumothorax needle was withdrawn, and cyanosis and dyspnœa were relieved in about 15 to 30 minutes at most, causing corresponding subjective improvement. The fall of temperature was well established in two to three hours, and the patient lost that appearance of acute distress characteristic of pneumonia.

POSSIBLE DANGERS.

Certain practical dangers had been suggested, some serious, others more or less fanciful. The serious ones were :—

1. *Pyopneumothorax.*—Seeing that empyema is a fairly common complication of pneumonia and that pleural effusion is almost equally common in artificial pneumothorax, this possibility was not to be lightly disregarded. To minimise the risk as far as possible, the very strictest precautions were taken with the aseptic technique during induction, for mixed infections, always dangerous, might in these cases have proved disastrous. Similarly, the greatest care was taken to avoid unnecessary injury of the pleura, and the points for the various refills were spaced well apart. For the rest, the very closest watch was kept on the cases, clinically and radiologically, for any sign of pleural effusion, and none was discovered. There is no evidence, therefore, that the induction of artificial pneumothorax tends to increase the liability to empyema formation in pneumonia, when undertaken with proper precautions.

2. *Cardiac collapse* again is a recognised danger in the crisis, for it occurs normally, and was, therefore, to be anticipated here. In favour of the patient submitted to artificial pneumothorax treatment was the fact that the crisis was induced several days before it would ordinarily have occurred, and, presumably, the heart was better prepared to meet the process. On the other hand, the artificial crisis was at least as violent as the natural one. In young, and otherwise healthy, adults, the cardiac condition can be largely disregarded, but in elderly and debilitated patients it becomes a subject of primary importance, especially when treatment by artificial pneumothorax is adopted. The extent and severity of the artificial crisis depend directly on the volume of air admitted, and are thus largely within the control of the operator. In elderly patients especially, and to a less extent in all cases, it is suggested that reliance should not be placed solely on the artificial pneumothorax, but that full use should be made of other therapeutic measures.

A suggested technique is that a full crisis should be avoided and a series of small minimal fills given, just enough to initiate perspiration, and that the perspiration should then be encouraged by the use of a standard diaphoretic, such as aspirin, phenacetin, or Dover's powder. By this means the temperature will be lowered in a sequence of steps, as it were by lysis, with the minimum of strain on the pulmonary circulation, and, at the same time, a progressive detoxication will be accomplished. Advantage could also be taken in Group I. infections of the antitoxic effect of Felton's serum, and, at the same time, adequate support should be given to the heart, *sec. art.* Venesection should be of great use in this connexion. Further experience will be necessary, however, before the best procedure for these cases can be properly established.

Among the more fanciful dangers suggested were death by pleural shock, pulmonary abscess and gangrene, pulmonary embolus, and pneumococcal septicæmia. All that can be said is that these did not occur, and that there seems to be no very valid reason why they should.

It is a matter of indifference where the air is admitted; at first it was admitted over the middle of the consolidated area with the idea that any freshly formed fibrinous adhesions which might exist would be broken down by the passage of air between the solid lung and the pleura. There was, however, no evidence of any such state of affairs; the air entered quite easily, and the lung readily fell away from the chest wall. Touching the lung with the pneumothorax needle provoked no response from the patient, so the visceral pleura is evidently insensitive, even when acutely inflamed—in a marked contrast to the parietal pleura, which was acutely painful. An attempt to avoid this by injecting well away from the pneumonic area over healthy lung was not successful, the pleura being equally hyperæsthetic in this locality.

SUGGESTED PROCEDURE.

The following routine is proposed for average cases :—

(1) Preliminary medication one hour before induction with morphine gr. ¼. (2) Thorough local anæsthesia with novocain down to and including the parietal pleura. (3) Very thorough asepsis during induction. (4) A preliminary fill of 400–600 c.cm. of

3. *Pain.*—After the injections there is frequently a feeling of fullness in the rectum for a few hours, especially towards the end of the treatment Occasionally there is actual pain, and this may last as long as 24 hours. Severe pain means one of the following complications:—

(*a*) *Fissure.*—This develops in about 2 per cent. of cases and is due to the use of a speculum and the effect of the carbolic. It is more likely to occur if any leakage of the solution is not swabbed out with cotton-wool. The fissure must be treated before continuing with the injections.

(*b*) *Thrombosis or strangulation of a pile.*—This may follow if a pile prolapses after an injection and is not promptly replaced.

(*c*) *Thrombosed external pile.*—This may be the cause of the pain, but is probably not more likely to happen while the piles are being injected than at other times.

(*d*) *Necrosis.*—If the injection has been given into the mucous membrane, and this becomes white over an area of half an inch or more, necrosis will follow, and result in a superficial ulcer. There may be slight pain for a few days. Such ulcers heal quickly. If the injection has been given deeply into the pile and much pressure has been necessary, showing that diffusion has been limited by fibrosis, then deep necrosis may follow and be accompanied by pain.

4. *Hæmorrhage.*—(*a*) *Primary:* Appreciable bleeding may follow immediately the needle is removed. Without treatment, this may continue for several hours. If there is any bleeding or return of the fluid on withdrawing the needle, immediately apply a cotton-wool swab and hold it firmly in place until all bleeding has stopped. (*b*) *Secondary:* Slight secondary hæmorrhage may occur from superficial ulcers. Marked secondary hæmorrhage only occurs after deep necrosis. It is extremely rare after the modern method. I had one case when using 20 per cent. carbolic in glycerin and water.

5. *Urinary affections.*—There have been rare cases where the patient has had painful and frequent micturition after the injection, or there has been blood and albumin in the urine. These conditions have probably been due to an anterior injection given too deeply or to the effects of carbolic on the kidneys.

6. *Ischio-rectal abscess.*—This occurred twice in cases treated at hospital. It is probably caused by faulty sterilisation of the needles. In each case it was necessary to incise and drain the abscess.

Recurrence.—The treatment by submucous injections has not been in use long enough for me to state the percentage of recurrence. Treating 80 per cent. of cases by injections will give at least 10 per cent. of recurrences within two or three years. Many of these can again be made symptom-free by a further course of injections.

Injections do not interfere with a subsequent operation. In severe cases, where treatment has failed after several injections, the operation has proved easy, the bleeding has been remarkably little, and the final results excellent. The injection treatment of internal piles gives late results that are inferior to operative treatment. In spite of this, the majority of patients choose the injection method because it is ambulatory, is free from serious complication, is practically painless, and, on the whole, gives good results.

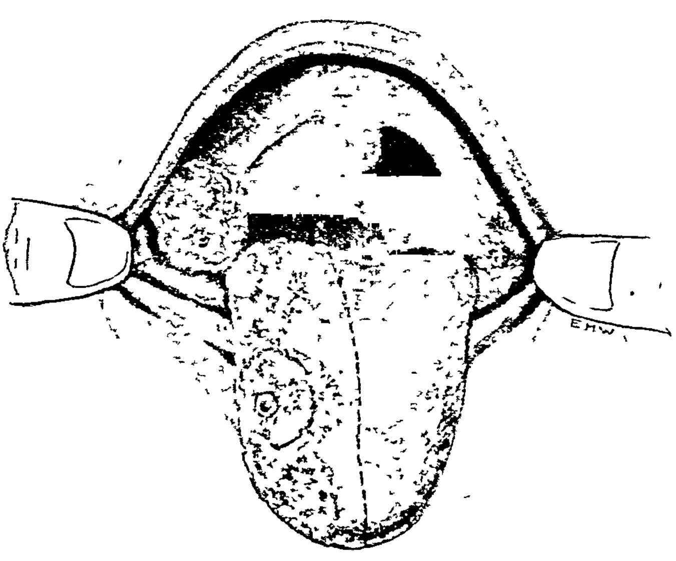
CLINICAL AND LABORATORY NOTES

A CASE OF PRIMARY CARCINOMA

DEVELOPING, AT INTERVALS, IN THREE DIFFERENT PARTS OF THE BUCCAL CAVITY.

BY LORD MOYNIHAN,
PRESIDENT OF THE ROYAL COLLEGE OF SURGEONS OF ENGLAND.

IN October, 1928, I removed the right half of the tongue of a man, aged 48, for "carcinoma in an early stage." There was a small hard sessile papillomatous tumour which was slightly ulcerated; it was surrounded by patches of old leukoplakia. Subsequently Crile's operation for removal of the glands of the neck was performed on the right side. In May, 1931, the patient returned with a large carcinomatous ulcer on the right anterior pillar of the fauces. This was treated with radium. There was no sign of disease in any other part of the buccal cavity. In October, 1931, the patient again returned, with a small wart on the inside of the left cheek; its base was hard. I removed it. The pathological examination showed "early carcinoma." The fauces and the remainder of the tongue showed no evidence of disease.



Composite drawing showing the three growths, which appeared separately.

All these three growths were discrete; there was no visible connexion between any two of them. The pathological reports of Prof. M. J. Stewart showed that each was malignant. In cases of early malignant disease of the tongue, easily accessible, I confess to a preference for surgery over treatment by radium. I have performed many operations for removal of half the tongue for carcinoma, and have never yet seen an example of local recurrence. I must state this explicitly because recently in consultation in London with one who is expert in the treatment of cancer with radium we differed as to the treatment of a case of very early carcinoma at the side of the tongue. My colleague's objection to operation was "the frequency of local recurrence after removal." As I have never met with an instance of this disaster I remain of the opinion that in of the water goes through the needle in the reverse direction and displaces the particles.

4. A pair of long Spencer-Wells *forceps*, to be used for swabbing.

5. A small bowl with cotton-wool swabs. The cotton-wool is made into balls the size of a walnut before being sterilised.

6. A bowl for used swabs.

7. A small enamel bowl or glass beaker into which the solution is poured so that it can be drawn up into the syringe.

8. A suitable lubricant such as KY jelly.

All instruments are sterilised by boiling before being used.

Solution.—The solution used is 5 per cent. carbolic in *Oleum arachis.* A small quantity of the oil is warmed, and the carbolic crystals are added. The crystals readily dissolve; the rest of the oil is then added. I have given up adding menthol to the solution. Almond oil may be used, but does not seem to keep well, and seems more likely than the other oils to produce symptoms. *Oleum nucis* (Wesson process) is good, but becomes thick and cloudy in cold weather and must be warmed before being used. The solution must not come in contact with water in the beaker, syringe, or needles.

Preparation of the patient.—If the patient is in the habit of taking liquid paraffin, this is stopped for two days before the injections. Aperients are not given, but it is best if the bowels open naturally before the injections are given. The patient lies in the left lateral position well to the side of the couch, with the thighs fully flexed and the knees slightly flexed. If, on inserting the speculum, the rectum contains liquid fæces these can be partly removed by wool swabs. A swab or two is then inserted high into the rectum to prevent more fæces coming down, and the portion of bowel below this is well cleared with swabs. The swabs are removed after the injections are given.

Injections.—The technique of injecting piles must be learnt by practice. The two chief difficulties are deciding where to inject, and how to keep the mucous membrane under observation. The first ring of injections must be given above the piles; subsequent injections are given over the middle, or over the lower part of the piles, but never lower than a quarter of an inch above the white line. When using my speculum the position in relation to the white line can be ascertained by partly withdrawing the slide; with experience this becomes unnecessary. Often, when giving a posterior injection, a fold of mucous membrane is seen about one inch above the white line; injections cannot be given above this fold, and if given too close to it, the needle may pierce the whole fold. If, on withdrawing the obturator of the speculum, one attempts to inject, the mucous membrane is pushed away, the needle becomes hidden among the folds, and the actual site of injection cannot be watched. To avoid this, firmly rotate the speculum so as to isolate and fix the portion of mucous membrane where the injection is to be given. Thus, if the injection is to be into the left side, rotate the handle to the right. It is necessary to acquire this knack of rotating the speculum.

The guard is arranged to expose 0·5 cm. of the needle. All air is expelled from the syringe. The needle is pushed through the mucous membrane by a quick, sharp movement, and is changed after each injection. The injections are given as follows at weekly intervals: first, 2 c.cm. anterior; second, 2 c.cm. each, right and left; third, 2½ c.cm. each, anterior and posterior; fourth, 3 c.cm. each, right anterior and left posterior; fifth, 3 c.cm. each, left anterior and right posterior. These quantities are to serve as a guide only. The mucous membrane must be kept under observation while the injection is slowly given. At the first appearance of any whitening the injection is stopped, no matter how little has been given. Whitening is most often due to giving the injection into the mucous membrane instead of deep to it. Often the mucous membrane becomes distended over an area the size of a shilling, assumes a bluish appearance, and the bright red vessels can be distinctly seen. When this stippled appearance is produced the injection is stopped. The stippled appearance is to be aimed at, but must not be expected as a rule with the high injections or with those given towards the end of the treatment.

The subsequent course depends on the progress made. If there are now no symptoms the patient returns in two or three weeks, and a final injection is given. The rectum is examined, and the injections placed where they seem to be required. Most commonly this final treatment will be 2 c.cm. anterior, 2 c.cm. right posterior, and 2 c.cm. left posterior, as these are the most common sites for piles.

If the symptoms are still present after the fifth injection, the treatment is continued at weekly intervals. If the piles continue to prolapse, expose a little more of the needle, so as to inject more deeply into the pile. Limit the quantity given deeply at one point to a maximum of 3 c.cm. and do not inject with much force. If an injection will not go in with moderate force, then fibrosis is sufficient at that point. It is particularly necessary to make sure that the high injections have produced fibrosis. When the high injections have been proved to be efficient, then inject at a lower level. Occasionally it is necessary to give 10 or 12 injections to cure prolapse.

It is very rare for bleeding to persist after the fourth injection. If it persists after a few more low injections, then it is probably not coming from the piles and the case requires further investigation.

Complications.

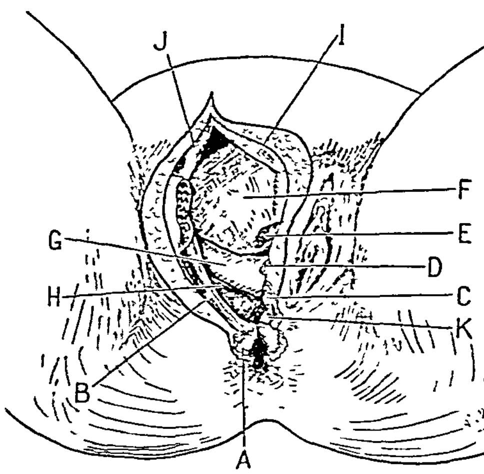
Various complications may occur in spite of the reports to the contrary. Most of these are probably due to the oil. The type of oil may not matter, but I am inclined to think that complications are more common after the use of almond oil.

1. *Unconsciousness.*—This occurred four times in about 300 cases, after the injection of 4–6 c.cm. All the cases were strong, healthy men, and unconsciousness occurred one or two hours after the first injection and lasted a few minutes. The patients felt well afterwards, and had no trouble with the subsequent injections. Mild symptoms, probably cerebral, that the patients find difficult to describe have occurred on rare occasions. Since limiting the first injection to a maximum of 2 c.cm. no cases of unconsciousness have occurred in the last two years.

2. *Influenza-like symptoms.*—These occur chiefly after the first injection, commence within 12 to 24 hours, and last one to three days. The temperature may reach 101° F. at night. In rare cases they may be repeated after the second injection, especially if it is given within a few days of the first. These symptoms have been practically eliminated since giving up the use of almond oil and menthol, not using a solution that has been made up for several weeks, and giving only 2 c.cm. at the first injection. More care has been taken with the sterilisation of all instruments, and water has not been allowed to come in contact with the solution.

there is sufficient force to split the urogenital triangle and wrench the pubic bones apart at the symphysis, which in the bent forward position is already under tension. Fig. III. shows the position of the seat relative to the perineum before an accident, the lines of force being directed through both ischial tuberosities. Fig. IV. shows the position of the seat caused by an accident, the line of force being directed through the urogenital triangle against the right pubic ramus.

FIG. V.



A, external sphincter; B, levator ani; C, bulbus vestibuli and bulbus cavernosus; D, crus clitoridis and ischiocavernosus; E, gracilis; F, bladder; G, vagina; H, rectum; I, medial head of rectus abdominis; J, lateral head of rectus abdominis; K, transversus perinæi.

The female pelvic outlet lends itself more than the male to the chance of this accident, because the female pubic arch is wider and more rounded. The pillars of the female arch "are somewhat excavated and sloped from within outwards, so that their inner surfaces look forward" (Gray), and present a larger area to any blow. The sharper the edge of the seat the more concentrated the force of injury.

A CASE.

This appears to have been the mechanical action in the following case where a motor bicycle, on trying to pass one car, was met by another coming in the opposite direction. The motor bicycle appeared to be thrown on its side, and skidded in that position for about 20 yards, taking the pillion rider with it. The driver died eight hours later from a very severe compound fracture of the right femur. The pillion rider, a girl aged 15 years, was admitted into Sutton Hospital at 10 P.M. on May 28th, 1931, in a state of severe collapse. Operation was performed two hours later. Inspection in the lithotomy position showed the injury as a large, well-defined tear beginning two inches above and one inch to the right of the symphysis pubis, and extending downwards through the right labium majus to and through the anterior wall of the anus. The right pubic bone fell away to the right of the middle line, showing a wound three inches in width, and exposing to view the bladder, vagina, and rectum. In detail the following anatomical damage was observed, and is shown in the accompanying sketch (Fig. V.).

Above the pubis.—The strong lateral head of the rectus abdominis was separated from the medial head of the rectus and from the pyramidalis for 2½ in. upwards, so exposing the cave of Retzius and the upper part of the bladder.

At the level of the symphysis pubis.—(1) The right pubic bone was separated from the fibro-cartilaginous symphysis. (2) Part of the right gracilis muscle, 1 in. in length, remained attached to the symphysis. (3) The subpubic ligament was torn across.

Through the urogenital triangle.—(1) The inferior layer of the urogenital fascia was torn in the line of the wound. (2) The crus clitoridis and the ischio-cavernosus muscle were torn from their attachments to the right ramus of the pubis and ischium. (3) Part of the right bulbo-cavernosus muscle was torn near its insertion into the perineal body. (4) The right transversus perinæi muscle was torn near its insertion into the perineal body. (5) The superior layer of the urogenital fascia was torn through and exposed the base of the bladder, the vaginal wall, the levator ani, and the lower part of the rectum. (6) The anterior border of the levator ani, running from the body of the pubis to the external sphincter and perineal body, was fully exposed, and the levator ani was completely separated from the vaginal wall.

Posterior to the urogenital triangle.—The anterior wall of the anus with the external sphincter muscle and fibres of the levator ani was completely torn across to a depth of 1½ in.

Operation.—1. The depth of the wound having been cleaned with spirit and saline, the pubic bone was drawn to the cartilage of the symphysis by silver wire passed in a mattress loop through both pubic bones. 2. The two heads of the rectus abdominis muscle were drawn together by interrupted catgut sutures. 3. The levator ani was united to the wall of the vagina by two fine catgut sutures. 4. The external sphincter and the torn levator ani fibres were united by deep and superficial catgut sutures. 5. For purposes of drainage, a piece of rubber glove was passed to the base of the bladder over the anterior edge of the levator ani. 6. The skin edges were drawn together by silkworm gut. 7. A rubber catheter was passed, and 3 oz. of slightly blood-stained urine were withdrawn. The catheter was retained for 48 hours, and liquid paraffin, ℥ss, was given thrice daily by mouth.

On the third day the catheter was withdrawn. Urine was passed voluntarily in the evening after an injection of pilocarpine gr. ¼. The vulvar parts were much swollen and discoloured, but there was no hæmaturia.

On the fourth day the rubber drain was removed and an enema was given. Urine was passed morning and evening after pilocarpine gr. ¼. On the seventh day full power was regained over micturition and defæcation.

For the first week there was a fair amount of purulent discharge from the wound which, with the exception of a small sinus at the upper end, healed completely at the end of four weeks. Two months after the injury the silver wire was removed by a transverse incision above the pubis, and firm fibrous union to the symphysis was demonstrated. A radiogram showed no other damage to the pelvis.

On the second day pitting œdema of the right leg and thigh was noticed. This cleared up in seven weeks, and obviously resulted from traumatic phlebitis of the right external iliac vein, probably due to sudden stretching. The only other associated injury was a lacerated flesh wound exposing tendons on the anterior surface of the right ankle-joint. It is probable that this was caused by a graze from the oncoming car.

The girl was able to walk out of hospital at the end of August.

Needless to say, the consequences of such an accident to a young woman may be very severe indeed, and although in these days of motor accidents pillion riders will always run the same risks as others, it may be that this particular form of accident can be prevented by the knowledge that sharply angulated saddles or seats are extremely dangerous.

SUGGESTIONS.

Pillion riding comes under the new "Road Traffic Act" of 1930 in so far that "only one pillion rider is to be carried and that person must sit astride on a proper seat securely fixed to the cycle." As far as I know, the Act makes no definition of what it means by "a proper seat." Three main types of pillion early cases where removal is easily possible it may still be preferred to radium, though radium has displaced surgery in all cases where extensive or mutilating operations would be necessary. In cases of removal of half the tongue, with well-planned incisions allowing of reconstruction, clear articulation is soon restored.

I have never before seen two separate primary malignant growths in the mouth. As there were three in this patient, I consider a record of the case may prove interesting.

THE PILLION RIDER'S PELVIC SPLIT ACCIDENT.

By J. M. Duff Mitchell, M.D., B.Sc. Aberd., F.R.C.S. Eng.,
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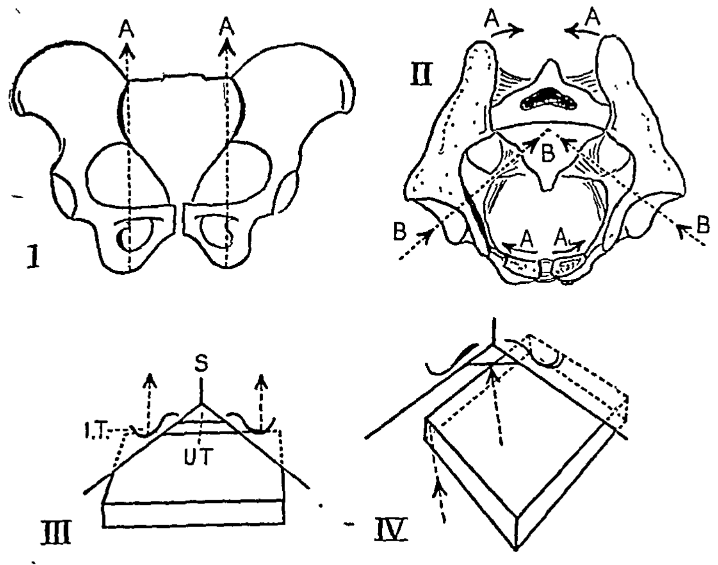
A SUDDEN splitting of the soft tissues of the pubis *and perineum, accompanied by separation of the* pubic bones and exposure of pelvic viscera, without any fracture, is an accident which one would expect to occur fairly commonly in pillion riders. I am not aware, however, of a case having been hitherto recorded.

In studying the special mechanics of this accident in regard to stress and strain, the formation of the pelvis and its ligaments should be briefly considered. Normally a slight amount of movement can take place in the sacro-iliac joints, the sacrum rotating round an imaginary line drawn transversely through its second piece; this range of movement is increased in the pregnant woman. To quote Cunningham: "In the erect posture the promontory of the sacrum is withdrawn to the full extent from the symphysis. When the body is bent forwards the symphysis and the promontory are approximated and, in consequence, the tension of the sacro-tuberous and sacro-spinous ligaments is increased." The anterior sacro-iliac ligament, as compared with the strong posterior ligaments, is very weak indeed.



Figs. I.–IV. (explanation in text). In Fig. III.: S = symphysis; U.T. = urogenital triangle; I.T. = ischial tuberosity.

In the erect sitting posture the sacrum forms the keystone to an arch, the lines of stress passing from the ischial tuberosities through the outer angles of the keystone, thereby pressing the iliac articulating surfaces against the outward-spreading sacral articulations (arrow A in Fig. I.). In the bent forward position, however, the keystone effect of the sacrum does not exist. In this position the line of pressure is through the ilium behind or outside the sacro-iliac joint; at the same time there is a rotatory movement at the sacro-iliac joint, so tensing the posterior sacro-iliac ligaments. In other words, in the bent forward position the sacrum is, in a measure, suspended from the iliac bones by the posterior ligaments, so that the lines of tension pull the ilia together behind the sacro-iliac joints, and by a system of leverage —through these joints acting as fulcra—two opposing stretching forces are directed on the symphysis pubis (arrow A in Fig. II.). This stretching force at the pubic arch is taken advantage of by obstetricians when they recommend patients in the last stage of labour to adopt the bent forward lying down position.

In the quadruped or in the bent position in man, with the weight of the body passing through the extremities, this tendency to separation at the pubis is counteracted by lines of stress passing through the acetabula and directed in front of the sacro-iliac joints, using them as fulcra in an opposing system of leverage (arrow B in Fig. II.). Any strain directed outwards against the rami of the pubic arch in a rider bent forward with no counteracting pressure through the acetabula would, of course, add to this separating force at the symphysis. The same mechanism takes place in the operation of symphysiotomy, where there is a tendency for the pubic bones to separate too far, unless an assistant exerts pressure through the acetabula by pressing both hips together (Fig. II.).

The pillion rider generally sits with the body inclined forwards, and with the thighs flexed at an angle of 90° with the trunk. In the erect posture the pelvic brim forms an angle of 60° to the horizontal; in the bent forward position, therefore, the line of the pelvic brim is almost perpendicular to the plane of the saddle. Viewed from the front the thighs form an angle at the pubis of from 80° to 100°. The average maximum angle in this position is about 120°, that is, 15° to 20° more for either thigh if the opposite one is fixed to the saddle. Any sudden stretching of this angle by forcible abduction of either or both thighs may possibly have the following consequences: (1) throw the rider free from the bicycle on the other side; (2) capsize both rider and bicycle, the underlying leg being fixed or free; the relative position of seat to perineum may or may not be altered.

Injuries from extreme and sudden abduction may conceivably range in severity from rupture of the adductor muscles to dislocation of a hip-joint. It is extremely doubtful whether severe and sudden abduction produced by leverage at a point in the thigh below the perineum would be sufficient to cause separation of the pelvic bones. By the time the force reached the pelvis it would have spent itself in damage or dislocation to knee- or hip-joints. If, however, the position of the seat relative to the perineum is altered so that, combined with excessive abduction, there is a direct blow or force exercised by the edge of the rider's seat on one side of the urogenital triangle, and the patient was upset by the examination, which he described as bullying.

On the following day, while scribbling on a piece of paper—one of the methods employed for recall—he wrote down and recognised his surname, which was not "Arthur," although it began with A. Later he stated that his christian name was Arthur. On the next day he was pouring cream into his tea. "That's lovely rich cream," he said, "Mary would like that," and realised that he had spoken his wife's name.

For two days no more memories were obtained, and he became tense and panicky, saying he wanted to get out, and felt cooped up. This was met by putting his bed on an open verandah. It was noticeable, however, that the disturbance came at a time when his memory was well-nigh restored.

A week after his appearance in Perth his wife arrived. Recognition was immediate, and the patient became emotional and tearful. His wife's account of the events was that early on June 19th, while staying with her in their new home in Somerset, the patient said he was not at all well and had a headache. He went to see a physician who told him he was nervous, and to be careful. (Possibly this is the memory which he has misplaced back to Australia.) Leaving the physician he went to the bank, drew two hundred odd pounds, and disappeared. She confirmed the details of his life story as he had told it. She said he was a non-drinker, a moderate smoker, and a satisfactory husband. The £200 was the balance of the purchase price of a small business which they had decided to buy. They were going to settle down as small shopkeepers in a little village in Somerset, and he was, in fact, intending to complete the transaction that day.

When he left the hospital he had no more recollection, he said, of the events between leaving Australia and the day he appeared in Perth, than he had on admission to hospital.

The physician whom he saw on the day when his fugue took place, Dr. T. H. A. Pinniger, of Glastonbury, was struck by his manner. He was restless, said he had a headache, and feared insanity. There appeared to be no physical disorder, and he was clear mentally. He wished, however, to be given medical grounds for not going on with the business deal on which he was engaged. Dr. Pinniger again saw him after discharge, and noted that the only amnesic features were a failure to recognise the auctioneer who sold him the business, and the previous owner. By July 20th his memory was not much better, and he still failed to remember the voyage home and the business purchase. As well as this information his wife stated that his health had not been good for some time before leaving Australia. Details, however, are not given. We are much indebted to Dr. Pinniger for his help and notes on this case.

COMMENT.

We have no doubt that this was a genuine case of hysterical fugue with a very clear psychological motivation. The patient was a young, active, healthy, pyknic, "mixing" type. He had led a roving adventurous life. He was Australian born, thought there was no country like it, and had during examination refuted the suggestion that he might be going to settle in this country. Before he left he had been comfortably off in an attractive open-air billet. His wife, a quiet, cold type, did not like Australia and had induced him to sell out and come home to run a pastrycook's business in a country village. It became clear that he was appalled at the idea of "settling down" so very finally and completely as the situation before him implied. He had described in examination the tormenting recollection of adding up interminable figures, referring no doubt to the scrutiny of the accounts of the little shop.

Adequate conscious motive for his conduct was absent. He had paid beyond hope of recovery a considerable sum for the business, and the £200 was equally the sum required to complete the purchase and the last of his capital. Within not more than 15 hours of his disappearance in Somersetshire he deliberately put himself in the hands of the police in Perth and afforded such clues that, had they been widely and promptly circulated, were bound to have attracted his wife's attention at once. On the appearance of his wife he was obviously unfeignedly relieved and glad.

It is of importance that the memory loss was not of the "all or nothing" type. His memory was not restored intact in a flash. It was a fragmentary return, some of it fortuitous, some by painful effort, and the disturbance could clearly be better described as a dysmnesic rather than amnesic. The well-marked affective reaction was also of interest.

The taking of a railway ticket for Perth by this man who wanted to go back to Perth, W.A., goes far beyond mere plausibility, and is either inspiration—in which case he did not follow it up—or the genuine expression of a well-established hysterical phenomenon.

The scepticism of the police has already been mentioned. The possession of a large sum of money in unusual form by a rather shabby and unlikely individual, who could not account for himself or it, combined with their previous experience of apparently similar cases, and lastly the rapid production of valuable names and addresses during and after the police interrogation, contrasting with the slow and apparently reluctant recall of unhelpful details under medical methods, made the official opinion that the man was a malingerer very difficult to combat. (We ought to say that later the police were converted, and were most kind and helpful to the patient and his wife.) But the case demonstrates that the problems of the hysterical fugue, not matters of life and death as in war, yet present in civil life, present various medico-legal difficulties and call for the most careful investigation.

A CASE OF FOCAL OSTEITIS FIBROSA.

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ASSISTANT SURGEON TO THE WEST LONDON HOSPITAL.

(WITH ILLUSTRATIONS ON SPECIAL PLATE.)

THE case to be described is of special interest at the present time, when attention is being focused on osteitis fibrosa associated with parathyroid tumour and disturbance of calcium and phosphorus metabolism. No such metabolic disturbance could here be demonstrated and no general absorption of calcium was found; yet the wide distribution of the disease suggests that the condition is not completely described as "focal." L. Ollier (1899) noted its tendency to affect the homolateral extremities, while others [1-3] have remarked its association with the area of supply of a peripheral nerve; and these facts are probably significant.

The mode of onset, without pain or fracture, the degree of involvement of the skull, and the paraplegia from deformity of the spine make this case peculiar. It illustrates features of a disease with affinities, seats are on the market at the present time, and none of them eliminates the chance of this type of accident.

1. Probably the most used and the most dangerous is the oblong skeletal iron framework, fixed above the mudguard, on which can be strapped either luggage or a padded cushion for a pillion rider.
2. An iron oblong skeletal framework similar to the above, but having attached to it a number of spiral springs supporting a padded leather cushion. This is commonly used, and is capable of causing the above type of accident.
3. A pneumatic or sorbo leather cushion with no solid framework, attached to and resting on the mudguard, which in the modern motor bicycle is about 6 in. broad. This pattern, although much superior to the others, does not entirely eliminate danger from the edge of the mudguard or from the tool-bag cages, which are generally on either side of the mudguard.
4. As the best pattern I would suggest a design similar to a horse's saddle, fixed like (3) to the mudguard, but with padded side flaps, and given spring by means of enclosed air cushions.

I would also recommend that motor insurance companies should insist on having a design as free as possible from the dangers associated with the present types.

A CASE OF HYSTERICAL FUGUE.

By W. D. Chambers, M.D., F.R.C.P. Edin.,
MEDICAL SUPERINTENDENT, JAMES MURRAY'S ROYAL ASYLUM, PERTH;
AND
W. McC. Harrowes, M.D. Glasg., D.P.M.,
DEPUTY MEDICAL SUPERINTENDENT.

A case of hysterical fugue which recently passed through our hands is reported because, though according to the police-court reports in the daily press such cases are by no means rare, they do not often appear to be very closely investigated from the psycho-pathological point of view.

CASE-HISTORY.

About midnight on June 19th, 1931, a man of early middle age approached a constable in a street in Perth, N.B., and said to him: "Are you a policeman? Can you tell me where I am?" He was sober, clean and reasonably tidy, and his behaviour was conventional. He was told he was in Perth, and appeared surprised, saying: "This is not Perth—that's where I live." Assured that he was in Perth, Scotland, he said that he ought to be in Perth, Western Australia.

So normal did he otherwise seem to be that the constable, after a brief and unfruitful examination at the police office, guided him to an hotel where he was given a room in which he passed a sleepless night.

On the following day at noon he was seen by one of us. He looked physically well, but was worried, dejected, and uneasy. He wore a frown and was restless. He complained of a dull pressure type of frontal headache and of a sharp occipital pain. His conversation was clear, rational, and not retarded. Enunciation was clear. He stated that he could not recall his name, whence he came, or anything at all of his past history.

In his pocket had been found two Bank of England notes each of £100, a notebook containing business cards of a firm in Perth, W.A., and a number of addresses, and he had a few coppers. During interrogation he admitted a vague recollection of some business activities in Perth, W.A., and a few minutes later began to wonder if his name might be "Arthur" and his initials "A. A. A." It should be noted here that Arthur might have been a christian name or a surname. He seemed puzzled about the banknotes, and said that he had never seen them before, and would never carry notes of such a denomination or so much money. Also he could not understand why he had no cheque-book. He had a silver watch with the initials J. T. on it, knew they were not his initials, but was certain that the watch was his property. Search of the clothing was unhelpful. His hat, with the name of a Perth, W.A., hatter, had the initials "A. A. A." on the band, and was padded with a Perth, W.A., newspaper.

After consideration he was advised to go to hospital for observation and treatment, to which he willingly assented. He had more than once asked the doctor if he were "going insane," and if he would recover. On the way to the hospital he asked if he were being taken to an asylum.

On admission he was given treatment for his headache, and later divided doses of veronal totalling grs. xv. He was not questioned or disturbed, but reassured, and asked to refrain from forced efforts at recall.

Neurological and general physical examination revealed no abnormality. The mental status showed good retention and concentration. Calculation was well done. The orientation showed a fault (he said it was 1932), but was otherwise normal.

During the following 24 hours he slept almost continuously, waking for short intervals, and having a feeling of drowsiness and fatigue. Opportunity was taken of this to perform a hypnosis. The first attempt at hypnosis aimed at a light degree, and the suggestions were gradually made. He experienced some weariness and relaxation as suggested, but hypnotic closure of the eyes was not effected nor did he go into even a light hypnosis. In two hours, hypnosis was again attempted, using as suggestions the sensations experienced by him during the first attempt. Even with this generally powerful method no success resulted, indicating a high degree of resistance.

Recovery of memory was then begun on a conscious level by ordinary associational methods, and by initiating what might be expected to be stereotyped patterns of speech and thought. His thought content was investigated, and found to contain certain recurring items. These were the word Bristol, a memory of an automobile accident, the feeling that he had to catch a boat, the recollection of adding up columns of figures till he was wearied, and a vague idea that the £200 found in his pocket was for some business deal.

Gradually, in talk, he recovered an increasing number of details of his past, beginning from his early youth. He remembered his birthplace and birthday, school days and early jobs, his parents and his brothers and sisters. In this way he gave all his history in considerable detail up to and including the war years, at the end of which he had married. Thereafter he became more vague in chronology, but not in detail. This might have been normal, for he had been at many different places and had held a number of posts. The last clear memory was of being a real estate salesman in Perth, W.A., and of selling up his home as if to leave the country. He gave the street and number of the house he had there. He described a concussion with over a week's resultant unconsciousness, which had occurred when riding a steeplechase eight or nine years before.

Suddenly, while discussing some triviality at a break in the examination, he remembered the date of sailing from Australia and the name of the boat. He added that his wife had sailed before him, but could not remember if there were children with her. This recall seemed to bring some memories "to the tip of his tongue," where they were blocked against a marked resistance. Pictorial memories of the past were plentiful, but did not serve to fill in the amnesia. During examination with a sphygmomanometer he remembered having seen a physician before he left Australia, who warned him of a possible breakdown.

At this point the police intervened. The case had been reported in the local press. In the eyes of the police the patient was a simulator, either a criminal and a fugitive or a man who was attempting to extenuate or excuse a misdemeanour by a pretended loss of memory. They pointed out that within five years one of us had been consulted by them in three cases of alleged loss of memory, all of which had turned out to be simulation. Although two of these cases had not been subjected to a really searching test, in essence the police view was highly tenable.

He was seen by two detectives, who interrogated him for an hour and a half, telling him that in their eyes he was highly suspect. Under this pressure he recalled his wife's address, his father-in-law's name and address, and his sister-in-law's name. No other memories were obtained, cytes, 2 per cent.; lymphocytes, 32 per cent.); clotting time, normal: Wassermann and Kahn tests, negative.

Calcium Metabolism.—(Investigation by Dr. Donald Hunter.)

Date in 1931.	Serum calcium mg. per 100 c.cm	Plasma phosphorus mg. per 100 c.cm. (hæmolysed).	Plasma phosphatase.
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Slit-lamp report.—(Mr. C. E. Goulden): "In the centre of the fœtal nucleus of each lens there is a collection of fine opacities, which are not dense enough to interfere with vision. These belong to the earliest days of life."

Histology.—On Aug. 14th two fragments of rib were removed for examination and report. The tenth rib was normal bone, while the eleventh showed osteitis fibrosa. It was reported that there is no giant-celled tumour (myeloma) admixture.

Laminectomy was performed following a blood transfusion on Oct. 14th. The laminæ of the upper six, dorsal vertebræ were removed. Evidence of compression of the spinal cord at the level of the fourth vertebral body was found, pulsation below this level being absent, until the third lamina was removed. The spinal dura was not opened. No relief of symptoms has followed operation. X ray therapy has been given without obvious result.

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REFERENCES.

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4. Knaggs, L.: Inflammatory and Toxic Diseases of Bone, Bristol, 1926.

REVIEWS AND NOTICES OF BOOKS

Tumours of the Breast.

Their Pathology, Symptoms, Diagnosis, and Treatment. By Sir G. Lenthal Cheatle, K.C.B., C.V.O., F.R.C.S.; and Max Cutler, B.Sc., M.D. London: Edward Arnold and Co. 1931. Pp. 596. 50*s*.

For 35 years Sir Lenthal Cheatle has interested himself in the diseases of the mammary gland; this study has been his hobby as well as part of his profession, so that the subject must have occupied his thoughts during a large part of his life. His incidental publications have been numerous, and now, with the help of a younger American collaborator, Dr. Max Cutler, he has gathered together his accumulated material into one large volume. This forms so comprehensive a study of the diseases of the breast that wonder is immediately aroused as to why the title "Tumours of the Breast" should have been chosen. It is always pleasant to find more in a book than was expected instead of less, so that the surprise is of the right kind; and the volume must indeed contain the most detailed study of the diseases of the breast that has ever been published. Only the inflammatory lesions of the breast have been omitted, and these would in any case form but a small portion of a complete treatise.

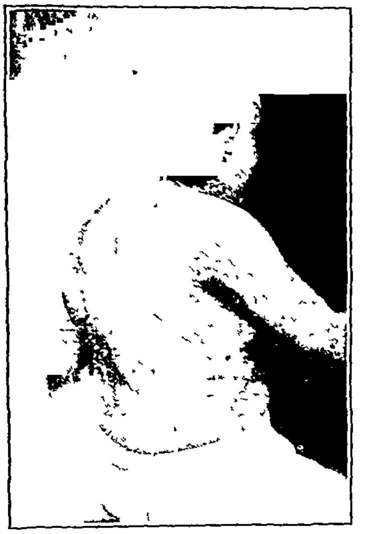
Sir Lenthal Cheatle has already published separate papers on "mazoplasia"—i.e., the "chronic mastitis" of other writers, on the genesis of carcinoma of the breast, and on Paget's disease of the nipple. All these subjects are here developed very fully, being preceded by exceedingly interesting chapters on the anatomy and physiology of the breast, congenital and acquired abnormalities, and "natural laws in pathological growth." There is nothing conventional about the views expressed and the outstanding value of his book lies in the fact that almost the whole of it is based on original observations. Original theory without an adequate basis of facts may always be mistrusted, but here this criticism is at once disarmed. The writings of other authors have been carefully sifted, and the listed references form a full index to the matter; but in addition the new theories are very fully documented with case-histories and illustrations of specimens and whole sections of the breast, cut by a special technique, which is described at the end of the book. The illustrations comprise, in fact, 18 coloured plates and 468 figures in the text, so that the authors' hope that the book may be used as an atlas as well as a work of reference is likely to be realised.

To the differentiation of mazoplasia from other innocent lesions of the breast prominent attention is given. It is claimed that this condition is really the result of a physiological process which is universally present up to the menopause, and few will nowadays question the propriety of abandoning the old name "chronic mastitis," with its unjustified implication of an inflammatory basis. There will be less general agreement as to making so clear-cut a distinction as is done by Sir Lenthal Cheatle between mazoplasia and the cystic lesions of the breast which may be lumped together under the name of "Schimmelbusch's disease." Some of the objections to his contentions have been urged by Mr. Sampson Handley in the Bradshaw lecture delivered last year before the College of Surgeons and published in these columns, and they may well be consulted. For this is probably the most arresting part of the book, since it has an important bearing on the genesis, and therefore the prophylaxis, of carcinoma of the breast. But extremely interesting to the specialist is Sir Lenthal Cheatle's very full account of Paget's disease of the nipple with descriptions of 17 specimens; this is, however, a rare condition, and is a relatively unimportant part of the general question of malignancy.

Sir Lenthal Cheatle's work is not intended to be a student's text-book, but is addressed rather to the pathologist and to the scientific surgeon. It is, in fact, one of those rare books, a clinical treatise inspired by a truly scientific spirit, so that every scrap of clinical evidence is used to the full, and every specimen obtained at operation or in the post-mortem room is scrutinised and made to yield its clinical and histological, to many other generalised and localised bone diseases, from Paget's disease to bone cysts—an affinity whose histological aspects have been well described by Lawford Knaggs.[4]

History.—The patient, a girl, 15 years of age, was perfectly fit until about three years ago, when she began to have difficulty in walking, and stiffness of the right knee, but without any pain. She was treated at the Tite-street Hospital for six months for flat-feet, and both ankles were in plaster for six months. After that the stiffness disappeared, and the patient was able to walk, though she was rather weak and unable to run. About nine months ago she became knock-kneed and was operated on at the Royal National Orthopædic Hospital. After this she was able to walk quite well, but still could not run. Later the difficulty in walking recurred, both legs being stiff, the right more than the left. In August, when admitted to West London Hospital, she could walk only very deliberately. She was quite well apart from the stiffness of legs and had never had any pain. She stated that she had had bony swellings over the left orbit and in the left little finger all her life. No fractures. No abdominal colic. Hearing good. Vision good. Action of bowels regular. Catamenia started at 13 years; regular, lasting three days. Micturition, no abnormality.

FIG. I.



Showing the irregular deformity of the head and the scolio-kyphosis of the spine. The operation scar for removal of portions of the tenth and eleventh ribs is seen on the right side.

Family history.—No history of bony abnormality or fractures. Mother, two brothers, one sister, one nephew (by sister) examined and found normal as regards skeleton. No history of bone defect in grandparents.

Physical examination. — Rather a slight girl, looks younger than her age. Weight, 6 st. 1 lb. Height, 4 ft. 5 in. Only slight development of breasts, but well-marked development of pubic hair. Teeth excellent. Tongue and throat clean. No enlarged glands, no œdema; no anæmia, jaundice, cyanosis, or clubbing. Sclerotics very slightly blue. No enlargement of the thyroid.

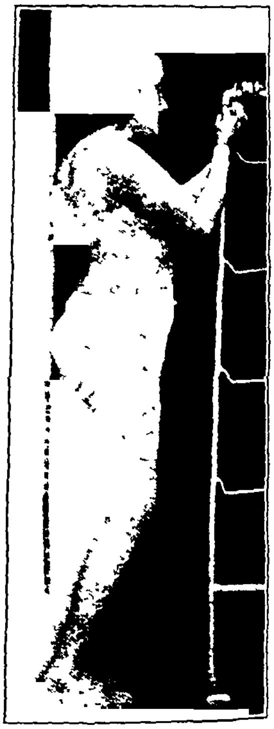
Cardiovascular system.—Apex-beat inside the mid-clavicular line; first and second sounds all areas. Blood pressure: 90 systolic, 50 diastolic.

Lungs.—Vesicular breathing, no added sounds.

Abdomen.—Slightly distorted from scoliosis (Figs I. and II.); nothing abnormal palpated; no tenderness.

Central nervous system.—Pupils equal, and central, react to light and accommodation. Cranial nerves normal. Upper limbs: deep reflexes present and equal, not exaggerated; no disturbance of motor or sensory functions. Trunk: abdominal reflexes absent: no band of hyperæsthesia detected, and no abnormalities of sensation; but on inspiration, muscles of the fourth intercostal space move well, muscles of the fifth space less well, and muscles of the sixth space not at all (Dr. George Riddoch). Lower limbs: marked spasticity in extension, especially of the right; very marked paresis; considerable wasting of calf muscles; knee-jerks exaggerated and equal; ankle-jerks exaggerated, right more than left; ankle-clonus present on the right side; plantar response, extensor, right and left; sensation to pinprick and touch appears normal; no loss of postural sense.

FIG. II.



Showing the good general nutrition of the patient. The spastic position of legs is well seen.

The main features of the skeleton are as follows:—

Skull.—(Fig. III.) Measures 22·5 in. in circumference, and is very irregular. There are three large bony bosses: (1) anteriorly, over the left frontal region, just outside the orbit, the size of a plum (4·5 by 2·5 by 1 cm. deep); (2) posteriorly, in the left occipito-parietal region, the size of an orange (15 by 10 by 5 cm.); (3) posteriorly, in the right occipital region, the size of a plum (6 by 5 by 1 cm.). These masses are not tender; they are merely prominences of the bone.

Limbs.—The limb bones are normal, except the ulnar half of the left hand (Fig. IV.), which shows a slight smooth bony swelling of the fourth and fifth metacarpals. The left little finger has a fixed flexion deformity. Rather excessive radial deviation of the forearms on the arms. Tibiæ 13·5 in. equal in length.

Spine.—(Figs. V. and VI.) There is marked scoliokyphosis, with the greatest curvature in the thoracic region to the right with winging of the right scapula. There is no tenderness of the spine, and no noticeable displacement of the vertebræ.

Ribs.—Slight irregularities can be felt. Harrison's sulcus is seen.

Pelvis.—Normal.

The following is a summary of the radiological reports.

Hands.—Union of all phalangeal and metacarpal epiphyses. Right, normal. Left (Fig. IV.), osteitis fibrosa of first, fourth, and fifth metacarpals; first, fourth, fifth prox. phalanges, and all phalanges of the third, fourth fingers. All epiphyses are joined almost five years before time.

Forearms and arms.—Nil, except epiphyseal advance.

Feet.—No loss of calcium, but possibly striæ in the patient are accentuated and possibly some loss of joint space. Epiphyseal advance.

Tibiæ.—Slightly less calcium than control. Definite linear rarefaction on zone of calcium decrease in region of epiphyseal line. Definite accentuation of striæ and bone pattern.

Femur.—Zone of decreased calcium deposit at epiphyseal line. Accentuation probably due to decrease in calcium deposit throughout. Deformity of lower end of femur, with buttressing on concave side. Upper epiphyses joined.

Pelvis.—The sacrum is prominent. Epiphysis at iliac crest not joined, other epiphyses joined two to three years before time.

Chest.—(Figs. V. and VI.). There is enormous deformity, most marked between the second and sixth vertebræ, with angulation at the fourth. Osteitis fibrosa affecting the vertebral bodies and the ribs on both sides.

Kidneys.—No evidence of renal calculus.

Special investigations gave the following results:—

Blood.—(August 25th) red cells, 5,030,000; hæmoglobin, 86 per cent.; leucocytes, 8400 (polymorph neutrophils, 55 per cent.; polymorph eosinophils, 1 per cent.; monocytes, 2 per cent.; lymphocytes, 32 per cent.); clotting time, normal; Wassermann and Kahn tests, negative.

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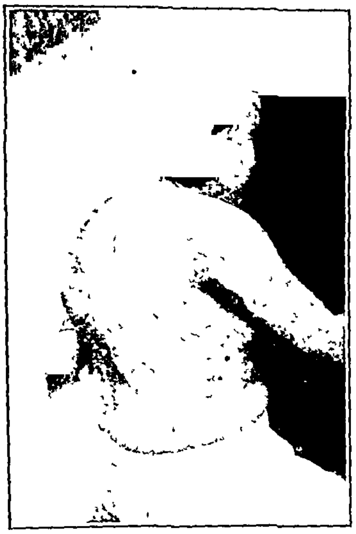

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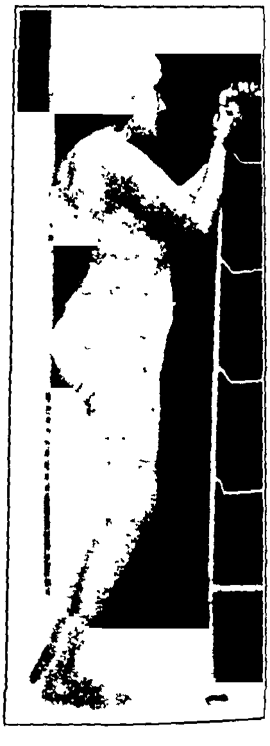
Central nervous system.—Pupils equal, and central, react to light and accommodation. Cranial nerves normal. Upper limbs: deep reflexes present and equal, not exaggerated; no disturbance of motor or sensory functions. Trunk: abdominal reflexes absent: no band of hyperæsthesia detected, and no abnormalities of sensation; but on inspiration, muscles of the fourth intercostal space move well, muscles of the fifth space less well, and muscles of the sixth space not at all (Dr. George Riddoch). Lower limbs: marked spasticity in extension, especially of the right; very marked paresis; considerable wasting of calf muscles; knee-jerks exaggerated and equal; ankle-jerks exaggerated, right more than left; ankle-clonus present on the right side; plantar response, extensor, right and left; sensation to pinprick and touch appears normal; no loss of postural sense.

FIG. II.



Showing the good general nutrition of the patient. The spastic position of legs is well seen.

The main features of the skeleton are as follows:—

Skull.—(Fig. III.) Measures 22·5 in. in circumference, and is very irregular. There are three large bony bosses: (1) anteriorly, over the left frontal region, just outside the orbit, the size of a plum (4·5 by 2·5 by 1 cm. deep); (2) posteriorly, in the left occipito-parietal region, the size of an orange (15 by 10 by 5 cm.); (3) posteriorly, in the right occipital region, the size of a plum (6 by 5 by 1 cm.). *These masses are not tender;* they are merely prominences of the bone.

Limbs.—The limb bones are normal, except the ulnar half of the left hand (Fig. IV.), which shows a slight smooth bony swelling of the fourth and fifth metacarpals. The left little finger has a fixed flexion deformity. Rather excessive radial deviation of the forearms on the arms. Tibiæ 13·5 in. equal in length.

Spine.—(Figs. V. and VI.) There is marked scolio-kyphosis, with the greatest curvature in the thoracic region to the right with winging of the right scapula. There is no tenderness of the spine, and no noticeable displacement of the vertebræ.

Ribs.—Slight irregularities can be felt. Harrison's sulcus is seen.

Pelvis.—Normal.

The following is a summary of the radiological reports.

Hands.—Union of all phalangeal and metacarpal epiphyses. Right, normal. Left (Fig. IV.), osteitis fibrosa of first, fourth, and fifth metacarpals; first, fourth, fifth prox. phalanges, and all phalanges of the third, fourth fingers. All epiphyses are joined almost five years before time.

Forearms and arms.—Nil, except epiphyseal advance.

Feet.—No loss of calcium, but possibly striæ in the patient are accentuated and possibly some loss of joint space. Epiphyseal advance.

Tibiæ.—Slightly less calcium than control. Definite linear rarefaction on zone of calcium decrease in region of epiphyseal line. Definite accentuation of striæ and bone pattern.

Femur.—Zone of decreased calcium deposit at epiphyseal line. Accentuation probably due to decrease in calcium deposit throughout. Deformity of lower end of femur, with buttressing on concave side. Upper epiphyses joined.

Pelvis.—The sacrum is prominent. Epiphysis at iliac crest not joined, other epiphyses joined two to three years before time.

Chest.—(Figs. V. and VI.). There is enormous deformity, most marked between the second and sixth vertebræ, with angulation at the fourth. Osteitis fibrosa affecting the vertebral bodies and the ribs on both sides.

Kidneys.—No evidence of renal calculus.

Special investigations gave the following results:—

Blood.—(August 25th) red cells, 5,050,000; hæmoglobin, 86 per cent.; leucocytes, 8100 (polymorph neutrophils, 55 per cent.; polymorph eosinophils, 1 per cent.; mono-use. The book has been prepared under the auspices of the American Association of Clinical Pathologists, and all methods included have had the sanction of at least five members of the Association. That some standardisation of clinical pathological methods is desirable there can be no doubt. The work has been undertaken under the wise direction of Prof. Kolmer; it should find a place in every up-to-date pathological laboratory.

The first edition of Prof. Todd's work appeared in 1908; since then, as Prof. Todd remarks in his introduction, "clinical pathology has undergone marvellous development and the book has of necessity grown in size and scope with each new edition." It has long been known throughout the English-speaking world and there must be few pathological laboratories either in this country or America in which it is not frequently consulted. This seventh edition, like all its predecessors, shows discrimination in the choice of simple and yet efficient methods of technique and in disregard of the unessential. These characteristics make it peculiarly valuable to the student.

"Bedside Interpretation of Laboratory Findings" is a book by a clinician and for clinicians. Prof. Wohl shows a proper sense of the place played by laboratory procedures in modern medicine, and his interpretation of their results is sound and well balanced. While urging the practitioner to perform his own examinations where possible, he recognises that there are many procedures which are quite beyond either the time at the disposal of the clinician or the capacities of his "office" apparatus. It is doubtful if anyone even with the help of such a book as this can correctly interpret the results of a laboratory test unless he himself be fully conversant with its technique; the converse proposition—that no test, not even the Wassermann reaction, can be correctly interpreted in the absence of full knowledge of the individual case is given full weight by Prof. Wohl. In face of the present widespread belief that it is possible satisfactorily to divorce the laboratory worker and the clinician this truth cannot be restated too often. Prof. J. McFarland, of the Department of Pathology of the University of Pennsylvania, contributes an introduction in which he deplores the disappearance of the "old time family doctor," a class which, according to him, must now be relegated to the "company of medicine men, magicians, and priests of antiquity." This seems a somewhat hard judgment. Fortunately in this country the family doctor is still with us and it is in particular to him that Prof. Wohl's book will be of value.

Headache.

By William H. Robey, M.D., Clinical Professor of Medicine, Harvard Medical School. London: J. B. Lippincott Company. 1931. Pp. 234. 21s.

Prof. Robey, like most writers on headache, comments on the frequency with which the symptom is encountered and the multiplicity of causes that may be responsible for it, as well as on the difficulty of classification and complete comprehension. On the whole, he has been as successful as any of his predecessors, and his monograph may be recommended as a reliable guide. It is regrettable that in places the style is careless and even slovenly, although three colleagues are indicated as associated with proof reading. The arrangement employed in the formation of paragraphs with arresting headlines is occasionally peculiar.

The material too is uneven: there is disproportionate detail in some chapters; in others the subject receives scant presentation. The allotment of only two and a half pages to drug treatment is certainly inadequate. Admittedly the first consideration of a physician when confronted with a case of headache is to isolate the cause in the hope of employing appropriate measures, but it falls to the lot of every practitioner to be frequently compelled to resort to purely symptomatic treatment; and something more than mere enumeration or formal reference to the properties of the numerous analgesics in use is expected in a monograph. The author sometimes allows himself to be diverted from his subject. Having mentioned that trichiniasis may cause headache, he proceeds to an unnecessarily detailed clinical study of a case in his experience: a reference to mercury leads to the description of a sensational suicide by corrosive sublimate. Alcohol is admittedly a cause of headache, but that hardly justifies a somewhat undignified reference to dipsomaniacs and secret drinking. And whilst the information imparted in the analysis of the causes and treatment of constipation is unexceptionable, it is out of place in the present connexion. The chapter on migraine stands out as authoritative, though we do not share the author's regret that patients are not properly instructed by their physicians in the examination of their excreta. The statistics in connexion with cerebral tumours are most instructive and useful. The defects of Prof. Robey's book are especially noticeable because parts of his book are so good.

Elektrophorese, Elektro-osmose, Elektrodialyse in Flüssigkeiten.

By P. H. Prausnitz, Dr.-Ing. (Jena), and J. Reitstötter, Dipl-Ing., Dr. Phil., Dr. Techn. (Berlin). Dresden and Leipzig: Theodor Steinkopff. 1931. Pp. 307.

This treatise, which the authors rightly describe as a compilation of facts in which as far as is possible unproved hypotheses have been avoided, deals with the phenomena which appear when electric fields are applied to colloidal systems in the broadest sense. The three factors concerned in electrophoresis, electro-osmose, and streaming potentials are a potential difference between the liquid and particles therein, relative motion between them, and a potential between two electrodes in the liquid. If a potential be so applied, motion occurs, the particles moving if they be suspended in the liquid, or the liquid moving if the particles be fixed as a diaphragm; conversely, if relative motion be applied by forcing the liquid through a diaphragm a P.D. is set up between the electrodes. These phenomena depend in magnitude on the electrokinetic potential, and the exact part of the book is concerned largely with the modification of the electrokinetic potentials by many important factors, such as dielectric constant, adsorption, nature of the particles, and of the ions in the solution. Electrodialysis, the promotion and acceleration of true dialysis by application of an electric potential difference, is linked to the other phenomena discussed by its dependence on the permeability of membranes. The authors are to be congratulated on using the term "elektrophorese" exclusively; since the great proportion of particles in watery media migrate to the anode, the popularity of the term "kataphoresis" is to be wondered at. "Elektro-osmose" is used instead of the longer "elektro-endosmose."

Apart from the treatment of the purely scientific aspect of these phenomena and a fully illustrated share of ocular demonstration. The authors have carried out their task admirably and have received from their publishers excellent technical support.

Science and Practice of Dental Surgery.

Second edition. Edited by Sir Norman Bennett, M.A., M.B., L.D.S., Consulting Dental Surgeon to St. George's Hospital and the Royal Dental Hospital. London: Oxford University Press, Humphrey Milford. 1931. Two vols. Pp. 1568. £4 4*s.*

The first edition of this book was published as long ago as 1914, and it is common knowledge that the appearance of this edition has been eagerly awaited for some years. But the task of revising thoroughly a book on such a large scale as this, especially in view of the many advances which have been made in dentistry, must have been very great. The first edition was in one volume with double columns of type. In many respects it was unwieldy and awkward to handle, while the illustrations were not always adequate. This edition has been expanded into two volumes and at the same time considerably enlarged. The paper is better and the illustrations, which are of excellent quality, have been increased from 993 to over 1200.

The revision has been thorough and in many cases the articles are entirely fresh. It is significant of the growth of orthodontics that the greater part of the first volume, over 600 pages, is devoted to this subject from the pens of the Editor and Mr. H. Chapman. Some may regard such an allocation as excessive in a book which is intended for the general practitioner, and in view of the comparatively small part which orthodontics play in dental practice. But while the general usefulness of this book might have been increased if some of the space devoted to orthodontics had been allotted to other subjects which are treated with considerable brevity—such as local anæsthesia which is not adequately described—yet the school of dental surgeons, which is interested particularly in orthodontics, will be grateful for the masterly exposition supplied by the editor. It is inevitable that in a book with many contributors the sections should be of unequal value and that overlapping and lacunæ will both exist, but the most serious risk, that of contradictory statements, is avoided. Readers according to their special predilections may cavil at the excessive space given to some subjects and the scanty measure granted to others. But on whatever aspect of dentistry information is sought, with only the rarest exceptions, a sound account will be found.

We note with some regret that the section on the legal aspects of dentistry which appeared in the first edition has been omitted, for this is a subject of great importance, and the practitioner might have been greatly aided had an authoritative section on the legal complications of dental practice been included. Among the various sections a few may be singled out for special praise. The chapter on gold inlays, by J. G. Parfitt, is a masterly account, clear and concise. The chapter on odontomes, by W. James and E. A. Councell, is full of interest, and contains some new matter bearing on the ætiology of dental cysts and granulomata of a quite startling character. The chapter on fractures of the jaws, by Kelsey Fry, is another excellent résumé. The practitioner who desires to keep abreast of advances in dental surgery will add these volumes to his library.

Laboratory Diagnosis.

By Edwin E. Osgood, M.A., M.D., Assistant Professor of Medicine and Biochemistry, University of Oregon School of Medicine; and Howard D. Haskins, M.D., Professor of Biochemstry at the School. London: J. and A. Churchill. 1931. Pp. 475. 21*s.*

Approved Laboratory Technique.

Prepared under the Auspices of the American Association of Clinical Pathologists. By John A. Kolmer, M.D., Dr. P.H., Professor of Pathology and Bacteriology, Graduate School of Medicine, University of Pennsylvania; and Fred Boerner, V.M.D., Associate Professor of Bacteriology at the School. Assisted by C. Zent Garber, A.B., M.D., Associate in Pathology, Peking Union Medical College. London: D. Appleton and Co. 1931. Pp. 663. 30*s.*

Clinical Diagnosis by Laboratory Methods.

Seventh edition. By J. Campbell Todd, Ph.B., M.D., late Professor of Clinical Pathology, University of Colorado; and Arthur H. Sanford, Professor of Clinical Pathology, University of Minnesota. London: W. B. Saunders Co., Ltd. 1931. Pp. 765. 28*s.*

Bedside Interpretation of Laboratory Findings.

By Michael G. Wohl, M.D., Associate Professor of Experimental Medicine, Temple University Medical School. London: Henry Kimpton. 1931. Pp. 321. 25*s.*

Prof. Osgood and his collaborator have adopted the somewhat unusual plan of dividing their work into two parts, the first dealing with indications and interpretations, and the second with technique. This gives the volume an interesting outlook wider than that of the ordinary text-book on clinical pathology. The first part will be of interest to those not actually engaged in the performance of laboratory aids to diagnosis. It is comprehensive and, on the whole, sound. The authors have shown originality in including a section on the clinical pathology of pregnancy, a subject which is usually passed over in works of this sort; this is not the strongest section of the book, but is of definite value. To speak of eclampsia as a "specific" toxæmia of pregnancy bespeaks optimism as to the state of our knowledge of the ætiology and pathology of this syndrome; and the assurance that eclampsia does not tend to occur in successive pregnancies must not be accepted without reservations. The effect of liver in the so-called "pernicious anæmia of pregnancy" awaits conclusive proof; the authors fail to mention the sovereign virtue of blood transfusion in this condition. Improvements resulting in simplification of the technique have made the Zondek-Aschheim reaction a less formidable undertaking than the description implies. Taken as a whole, however, the first part of the book should be of real value to students and practitioners, clinicians and laboratory workers alike. The section on technique is all that it should be; as might be expected from authors whose work on the normal blood has brought them an international reputation, Prof. Osgood and Prof. Haskins have provided a section on blood examinations which is particularly valuable.

The authors of "Approved Laboratory Technique" express the hope that it will promote the establishment of standards for the performance of the diagnostic laboratory procedures in general

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LITERATURE AND SAMPLES ON REQUEST FROM

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description of various ingenious types of apparatus, a large portion of the book is devoted to practical and industrial applications. The patent literature is abstracted at great length. In addition to the large number of references in the text, an extensive bibliography and a patent index complete a really modern reference book of great value. The application of the principles of electrophoresis and endosmose may well prove to be of great value in biology. Little has so far been done, but it seems that they may provide a weapon for the differentiation of proteins. Again, the electric charges on bacteria may be studied. For the purification of sera and antitoxins electrodialysis has been used; this is a field in which Dr. Reitstötter has done much work. But from the direct application of in-vitro results to processes in the living organism we are especially warned by the authors.

L'Anesthésie.

En pratique chirurgicale. By R. MONOD, Chir. des Hôpitaux de Paris. Paris: Masson et Cie. 1931. Pp. 154. Fr.22.

THIS small book gives a clear exposition of the principles on which general and local anæsthetics are best employed. Details of administration of various anæsthetics, and of the phenomena produced by their introduction into the body, are not, as a rule, attempted, but the reader is given sound and logical guidance in the choice of an anæsthetic, and the appropriate method of giving it to various kinds of patients and in different circumstances. The author has no predilection for any one method, pointing out forcibly that to-day there are many good methods and several anæsthetics, and that although a routine method may be satisfactory in many instances, yet there are many others where the surgeon's facility and the patient's good recovery can only be assured by selecting the method best suited to the particular condition present in the individual case. A surprising feature is the space and number of illustrations given to the subject of choloroform administration by apparatus of the "draw-over" type—a technique which we regard as almost obsolete. The administration of ethylchloride continuously for long operations is described, but adequate "gas and oxygen" apparatus for the same purpose is very inadequately noticed. Endotracheal anæsthesia has apparently not yet crossed the Channel, and the pages on spinal analgesia are meagre considering the importance of the method. On the other hand, the chapter on examining and treating patients before serious operations is excellent, and contains information not often found in books of this kind.

The Cause of Cancer.

By W. E. GYE and W. J. PURDY, M.B., Members of the Scientific Staff of the National Institute for Medical Research. London: Cassell and Co., Ltd. 1931. Pp. 515. 30s.

THIS important work contains controversial matter which cannot adequately be discussed in our review columns. A special article by Dr. W. Cramer on the latest developments of Dr. Gye's work, as set out in this book, will be found on p. 40 of this issue.

British Journal of Children's Diseases.

THE latest number of this journal (Vol. XXVIII., October–December, 1931) contains a paper on Experimental Scarlet Fever by Means of the Scarlatinal Hæmolytic Streptococcus, by Drs. T. Toyoda, Y. Futagi, and M. Okamoto, of the Japanese Government Isolation Hospital, Dairen, Manchuria. They record the inoculation of e[illegible] 3 to 7 years, by swabbing thei[illegible] of hæmolytic streptococci from scarlet fever cases. Positive results were obtained in three cases in which new strains of streptococci were applied, as shown by the appearance of sore-throat, fever, a rash, and a positive Schultz-Charlton reaction, whereas similar experiments undertaken on five cases with old strains of scarlatinal streptococci proved negative.—Dr. F. G. Wood-Smith, who contributes a paper on Purpura in Scarlet Fever, states that this is a rare complication. Both sexes are equally affected, but children more commonly than adults. The purpura, which is probably due to capillary damage caused by the toxin of the scarlatinal streptococcus, may develop during the course of any type of scarlet fever, whether mild or severe, the commonest time for its appearance being the third week of the disease. The platelet count, though often decreased, may be normal. All forms of purpura in varying degrees of severity may be encountered.—In a paper on Hair-eating and Pica in Children, Dr. Jean Smith reports the case of a girl, aged 3 years, who during six weeks passed four hair balls per rectum. On inquiry it was found that she had been in the habit not only of swallowing the hairs from blankets, but also eating wall-plaster and pieces of wood. Dr. Smith regards pica as a bad habit similar to thumb sucking, nail biting, masturbation, and some cases of enuresis, in which bad feeding, lack of training, poor surroundings, and limitation of interests all play a part.—Dr. W. Gordon Sears describes a case of Dwarfism with Stippled Epiphyses in a youth aged 19, the most striking features being the radiogram of transverse striation of the epiphyses of the femora and tibiæ.—In a paper on Helminths as a Cause of Meningitis, Dr. L. J. M. Laurent reports a case in a girl aged 3½ years sent to hospital certified as suffering from cerebro-spinal meningitis, the symptoms being vomiting, convulsions, photophobia, nuchal rigidity, and general irritability followed by drowsiness. The cerebro-spinal fluid, though under pressure, was clear and sterile, and recovery took place after evacuation of a large quantity of thread-worms. Reference is made to other cases of meningism or meningitis due to worms.—In addition to society intelligence, the issue contains an account of the International Congress of Preventive Pædiatrics held at The Hague last September, when the subjects for discussion were the mortality during the first ten days of life and return cases of scarlet fever. The index appended forms a useful guide to contemporary pædiatric literature.

REPORTS AND ANALYSES

TINTARA.

(P. B. BURGOYNE AND CO., BURGOYNE HOUSE, DOWGATE HILL, E.C.)

THIS Australian wine has been well known to the medical profession for very many years and has again been analysed with the following results.

Alcohol by volume	15·3 per cent.
Total extractives	2·31 " "
Containing sugar	0·50 " "
Fixed acidity (as tartaric acid) ..	0·49 " "
Volatile acidity (as acetic acid) ..	0·05 " "
Mineral matter	0·42 " "
Tannin, natural colouring matter and by-products of fermentation	0·85 " "

The mineral matter contains iron equivalent to 0·05 per cent. (as Fe_2O_3) of the extractives. Colouring matter not natural to a red wine was tested for with negative results. It is unfortified.

This is a natural and attractive wine of the Burgundy type. It may be described as rich to the palate, and the aroma is good. The low content of sugar will no doubt be appreciated by those whose sugar tolerance is below the normal. The amount of iron present adds to the tonic value of the wine.

THE LANCET.

LONDON: SATURDAY, JANUARY 2, 1932.

OUT-PATIENT FINANCE.

THE year 1932, which may test severely the principles of voluntary hospital finance, should see a speeding-up in the long overdue reform of the overcrowded out-patient department. At the present time nearly 4½ million new out-patients attend during the year at hospitals in England and Wales, and, while in the last decade the number of such new patients in London has increased by 10 per cent., the number of attendances has increased by nearly three times that percentage. It was expected that general practitioner service under the National Health Insurance Acts would gradually deplete the out-patient department; there was in fact a drop but only a temporary one, and the effect can no longer be discerned. Moreover, the recent approved society valuation shows that there will be less money available for additional benefits, which must now be cut down all round, and altogether discontinued in the case of 61 per cent. of insured women. The Hospitals Year Book calculates that the individual out-patient costs about 6*s.* 8*d.* It is not difficult to see that this little cumulative item may be the last straw that breaks a hospital's solvency, and we note with sympathy that the governors of the Newcastle Royal Infirmary have decided to limit the casual and out-patient departments of that great voluntary hospital to consultative work and to services of a special nature which are not available elsewhere.

In London where, so far, the more suggestions that are made for changing the out-patient hall the more the department remains the same thing, a small but significant proposal comes from without. The Hospital Saving Association, numbering close on a million members, would like to secure for them, on payment of a guinea, the right of seeing a consultant or specialist at his private house by appointment, instead of waiting to see him at hospital. Approach was made in the first instance to the head office of the British Medical Association which secured the general approval of its representative body, subject to acceptance of a scheme by a meeting of the consultants concerned. This meeting was held on Dec. 10th and decided by a substantial majority to draw up a list of physicians, surgeons, gynæcologists, dermatologists, oto-rhino-laryngologists, and consultants in physical medicine willing to see and advise at a modified fee members of the Hospital Saving Association and others of like economic status. It was said at this meeting that the Royal College of Physicians of London raised no objection to the principle of such mass consultations at a reduced fee, although Lord DAWSON expressed his personal conviction that in the long run no satisfactory service of the kind could be given outside the four walls of an institution.

This view of consultation as team-work has been growing in cogency ever since its first enunciation in the Dawson Report (Interim Report of the Consultative Council on Medical and Allied Services. Ministry of Health. 1920), and it is set out again in Dr. A. R. FRIEL's letter on p. 55. At one stage or another in most chronic illness a point is reached when some review of diagnosis or treatment or some pooling of information is desirable, which is outside the daily round of the most versatile individual practitioner. It is recognition of this fact that has filled the out-patient departments of teaching hospitals—for these deal with more than a third of the out-patients in the whole country—and has kept them full in spite of all the work of almoners and all the good intentions to carry out the recommendations of the committee appointed by King Edward's Hospital Fund for London 20 years ago. A good half of the out-patients now are believed to be consultation cases, and who would contend that the need for consultation is even yet fully met? The King's Fund raises the question whether out-patient departments should not be used only for purposes of consultation. That is one of the questions which has been remitted for consideration to a new committee of inquiry, of which the medical members are Sir JOHN ROSE BRADFORD and Dr. F. E. FREMANTLE. They will have to consider the possible relief afforded by other public medical services—including those taken over from the poor-law, and by a full use of general practitioner treatment, also bearing in mind what a large proportion of the population now contracts for hospital treatment by contributory associations. They will have to meet the oft-repeated claim that hospital out-patient departments are competing unfairly with the practitioner. Economic stringency is taking these matters out of the region of leisurely academic discussion into one of practical urgency. It may be, as the management committee of the King's Fund suggests, that the search for a solution of the out-patient problem may open up even wider questions than it did in 1911. But the solution must be found, and found quickly, if the voluntary hospital principle is to survive in the form we now have it.

◆

GASTRIC HYDROCHLORIC ACID.

THE exact part which the gastric hydrochloric acid plays in the bodily economy is still in some respects unexplained. The secretion has of course a definitely bactericidal action which may be of great importance; at the same time it is certain that some people go through life without producing any hydrochloric acid, yet suffer from no dyspeptic or general symptoms. In others, it is true, an absence of hydrochloric acid in the stomach is

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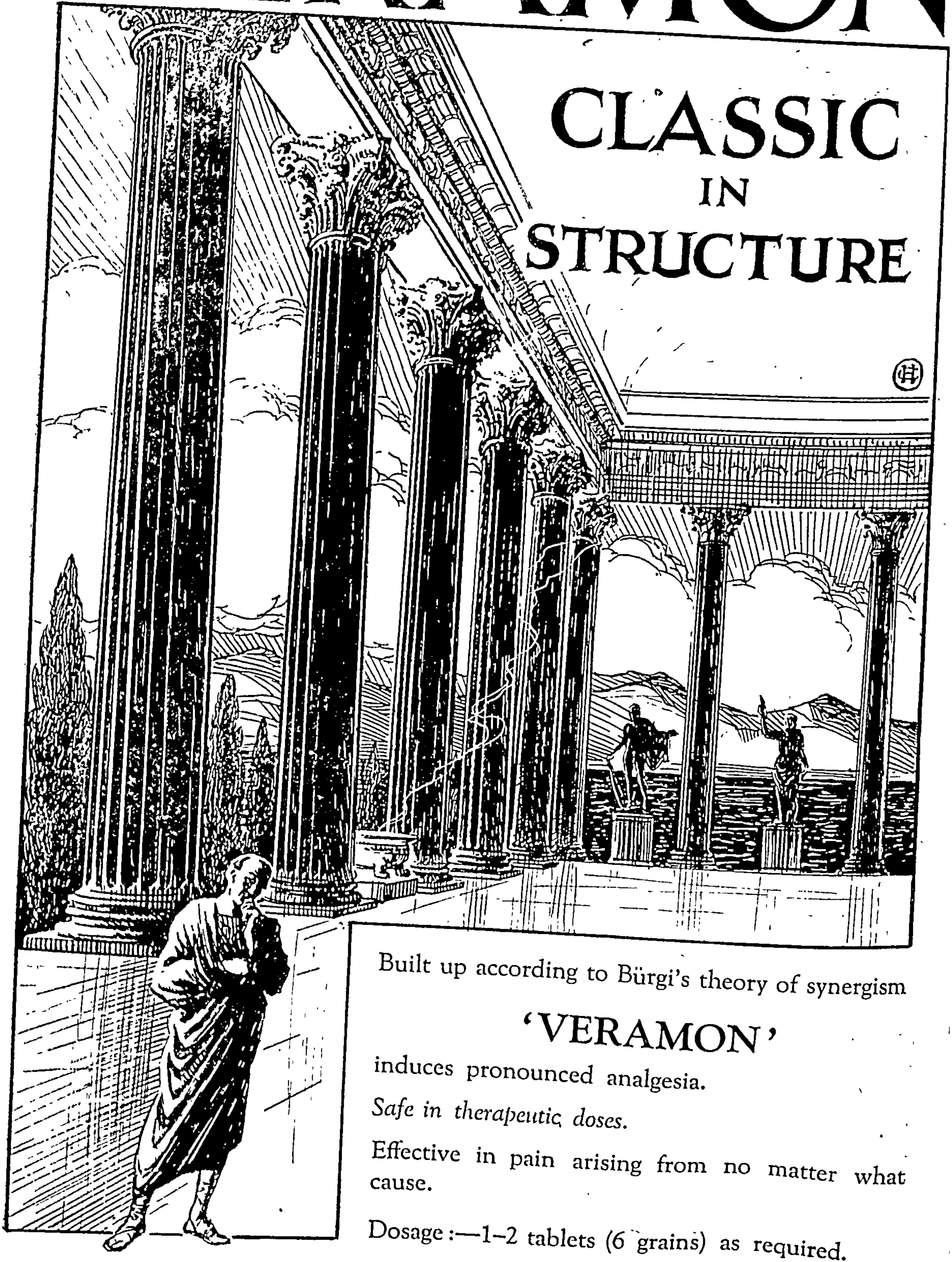

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THE year 1932, which may test severely the rinciples of voluntary hospital finance, should see a speeding-up in the long overdue reform of the overcrowded out-patient department. At the present time nearly 4½ million new out-patients attend during the year at hospitals in England and Wales, and, while in the last decade the number of such new patients in London has increased by 10 per cent., the number of attendances has increased by nearly three times that percentage. It was expected that general practitioner service under the National Health Insurance Acts would gradually deplete the out-patient department; there was in fact a drop but only a temporary one, and the effect can no longer be discerned. Moreover, the recent approved society valuation shows that there will be less money available for additional benefits, which must now be cut down all round, and altogether discontinued in the case of 61 per cent. of insured women. The Hospitals Year Book calculates that the individual out-patient costs about 6*s.* 8*d.* It is not difficult to see that this little cumulative item may be the last straw that breaks a hospital's solvency, and we note with sympathy that the governors of the Newcastle Royal Infirmary have decided to limit the casual and out-patient departments of that great voluntary hospital to consultative work and to services of a special nature which are not available elsewhere.

In London where, so far, the more suggestions that are made for changing the out-patient hall the more the department remains the same thing, a small but significant proposal comes from without. The Hospital Saving Association, numbering close on a million members, would like to secure for them, on payment of a guinea, the right of seeing a consultant or specialist at his private house by appointment, instead of waiting to see him at hospital. Approach was made in the first instance to the head office of the British Medical Association which secured the general approval of its representative body, subject to acceptance of a scheme by a meeting of the consultants concerned. This meeting was held on Dec. 10th and decided by a substantial majority to draw up a list of physicians, surgeons, gynæcologists, dermatologists, oto-rhino-laryngologists, and consultants in physical medicine willing to see and advise at a modified fee members of the Hospital Saving Association and others of like economic status. It was said at this meeting that the Royal College of Physicians of London raised no objection to the principle of such mass consultations at a reduced fee, although Lord DAWSON expressed his personal conviction that in the long run no satisfactory service of the kind could be given outside the four walls of an institution.

This view of consultation as team-work has been growing in cogency ever since its first enunciation in the Dawson Report (Interim Report of the Consultative Council on Medical and Allied Services. Ministry of Health. 1920), and it is set out again in Dr. A. R. FRIEL's letter on p. 55. At one stage or another in most chronic illness a point is reached when some review of diagnosis or treatment or some pooling of information is desirable, which is outside the daily round of the most versatile individual practitioner. It is recognition of this fact that has filled the out-patient departments of teaching hospitals—for these deal with more than a third of the out-patients in the whole country—and has kept them full in spite of all the work of almoners and all the good intentions to carry out the recommendations of the committee appointed by King Edward's Hospital Fund for London 20 years ago. A good half of the out-patients now are believed to be consultation cases, and who would contend that the need for consultation is even yet fully met? The King's Fund raises the question whether out-patient departments should not be used only for purposes of consultation. That is one of the questions which has been remitted for consideration to a new committee of inquiry, of which the medical members are Sir JOHN ROSE BRADFORD and Dr. F. E. FREMANTLE. They will have to consider the possible relief afforded by other public medical services—including those taken over from the poor-law, and by a full use of general practitioner treatment, also bearing in mind what a large proportion of the population now contracts for hospital treatment by contributory associations. They will have to meet the oft-repeated claim that hospital out-patient departments are competing unfairly with the practitioner. Economic stringency is taking these matters out of the region of leisurely academic discussion into one of practical urgency. It may be, as the management committee of the King's Fund suggests, that the search for a solution of the out-patient problem may open up even wider questions than it did in 1911. But the solution must be found, and found quickly, if the voluntary hospital principle is to survive in the form we now have it.

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GASTRIC HYDROCHLORIC ACID.

THE exact part which the gastric hydrochloric acid plays in the bodily economy is still in some respects unexplained. The secretion has of course a definitely bactericidal action which may be of great importance; at the same time it is certain that some people go through life without producing any hydrochloric acid, yet suffer from no dyspeptic or general symptoms. In others, it is true, an absence of hydrochloric acid in the stomach is associated with diarrhœa, which may be partly due to the passage of living organisms through the stomach into the intestine. But this diarrhœa may alternatively be ascribed to rapid emptying of the stomach, such as is commonly found with achlorhydria, and the consequent entrance of irritating and partly broken-up foodstuffs into the duodenum; and it is noteworthy that similar diarrhœa sometimes develops after gastro-enterostomy, although the hydrochloric acid secretion may be normal.

It has always been thought that the emptying time of the stomach is in some way associated with the acid secretion, and as long ago as 1907 W. B. CANNON definitely formulated the theory of the "acid control" of the pylorus, according to which the pyloric sphincter remains closed while the duodenal contents are acid, and opens when they become alkaline. Such chemical control by means of the gastric acidity was soon found incapable of explaining the whole mechanism of stomach evacuation, and other explanations were sought. J. EARL THOMAS[1] now suggests that the regulation is by stimuli both from the stomach and from the small intestine. Hydrochloric acid as such appears to play quite a minor part in governing the opening and closure of the pylorus, and THOMAS thinks that various factors are able, reflexly from the duodenum, to delay gastric evacuation by increasing the tone of the pylorus and inhibiting the motor activity of the pars pylorica. Of these factors, acidity may be one, but products of digestion (especially of fat) are others. As we noted not long ago,[2] the entrance of oil into the duodenum is capable of inhibiting both motor and secretory activity of the stomach, and THOMAS also records prolonged inhibition of the pars pylorica after introduction of fat into the duodenum, though only after quite a considerable latent period. There can no longer be any doubt that it is not the reaction alone, on either side of the pylorus, which governs the opening or closing of this sphincter, and the presence of hydrochloric acid is not necessary for normal gastric evacuation. Since neither the function of the gastric acid as a bactericide or as a regulator of pyloric activity appears to be essential, it has been suggested that its primary "purpose" may be to maintain the acid-base equilibrium of the body; that is to say, it is held that the stomach may behave somewhat like the kidneys and lungs, and excrete acid when the hydrogen-ion concentration of the tissues tends to shift to the acid side. Viewed in this light, the hydrochloric acid of the stomach would be an excretion—much as carbon dioxide in the lungs or acid phosphate in the urine are excretions—and its output would vary according to the condition of the body as a whole, rather than according to any conditions within the stomach itself.

F. L. APPERLY and M. C. CRABTREE,[3] without in any way entering into the discussion of such a theory, have lately recorded some experiments which suggest that the condition of the blood largely determines the secretion of hydrochloric acid and the emptying time of the stomach. They have studied gastric acidity by means of fractional gruel test-meals under varying conditions of plasma bicarbonate and blood reaction—i.e., in experimental conditions of alkalosis and acidosis similar to those occurring, for example, at high altitudes, or in diabetes. From their results in a number of ingenious experiments they conclude that the bicarbonate content of the blood plasma determines the concentration of the gastric hydrochloric acid during a fractional test-meal, and that the emptying time of the stomach is determined by the hydrogen-ion concentration of the blood. Such conclusions support the suggestion that the gastric mucous membrane may be an important regulator of the body's neutrality mechanism, and that gastric acidity is partly an expression of the reaction of the body as a whole. It would, for instance, be interesting to know the output of hydrochloric acid into the stomach after heavy exercise when "acid" is being excreted in large amounts in the urine and breath. To take another example, it may be that the achlorhydria found so commonly in fevers is not due, as K. FABER believes, to an endogenous or blood-borne gastritis from circulating toxins, but merely to relative excess of bicarbonate in the blood owing to over-breathing (hyperpnœa) and washing-out of alveolar carbon dioxide—a condition comparable to the hyperpnœa produced by immersion in a hot bath, in which APPERLY and CRABTREE found a diminished acid secretion of the stomach. Very broadly speaking, it may be that the more acid the body tends to become, the more hydrochloric acid will the stomach excrete, and the more alkaline the body, the less acid will the stomach put out, thereby maintaining the normal reaction of the tissues. If such views and observations were correct the question of gastric hydrochloric acid would assume a new significance, and R. BALINT'S treatment of gastric ulcer, by giving sodium bicarbonate intravenously and not by mouth, would be justified in theory. Hyperacidity would then become a question of an acid constitution rather than an over-acid stomach.

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RADIOPELVIMETRY.

IN his recent review of the work of the Rotunda Hospital[1] Dr. BETHEL SOLOMONS remarked that he believed the best results in pelvimetry were to be obtained by radiographic methods. Experiments along these lines were made in the very early days of radiology but were abandoned when the dangers of X rays became apparent, and gynæcologists have only recently found courage to resume them. At the present time there is no danger to mother or child. The technique employed does not vary very much, and is modelled on that devised by H. THOMS. The essential requirements are to place the patient in such a position that the brim of the s is horizontal above the film, to obtain a radiogram of the pelvic brim, and to correct measurements on the film for the distortion ting from the projection of the skeleton by rging rays on to a flat surface. Dr. L. A. DEN[2] describes a procedure that should offer ifficulty to any radiologist who wants to adopt The crucial point in all variations of the method ie correction of the distortion of the shadow, this is performed by almost every worker with variety of what Dr. Rowden calls a "pubic ." As part of his equipment, the radiologist ares a series of radiograms of a flat strip of lead ugh which have been punched a series of holes tly half an inch (or one centimetre) apart; essive films are exposed with this "ruler" sus-led in a horizontal plane at a series of distances ve the Potter-Bucky diaphragm corresponding the possible range of height of the symphysis is—in Dr. Rowden's practice at intervals of uarter of an inch from 4¾ in. to 6 in. The r is long enough to span the bony shadow, and s obvious that, since its image is distorted xact correspondence with the image of the is, it is an accurate scale by which to measure latter. Other workers use a steel strip with hes at each eighth of an inch, supported on patient's thighs during the exposure, and a nement used by Dr. H. J. Walton[3] is a chart le up from readings taken with his "false timetre scale" at various heights.

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[1] Jour. Amer. Med. Assoc., Dec. 5th, 1931, p. 1663.
[2] THE LANCET, 1931, i., 537.
[3] Jour. Physiol., 1931, lxxiii., 331.

[1] See THE LANCET, 1931, ii., 1240.

n every variety of technique the patient is placed ted at the end of a table on the Potter-Bucky phragm, with her back supported by a rest lined at an angle of about 55°. Dr. Rowden ocates the use of a motor-driven Sectogrid phragm, and places the patient with the centre her pelvis above the central ball-bearing of the pliance; Dr. Walton is content with a Potter-cky of the ordinary type. Dr. Rowden demands ube-film distance of not less than 4 ft. 6 in.; greater accuracy secured by the use of this tance must be paid for in the correspondingly ater load which it is necessary to put on the be. He finds it necessary to expose the posterior rtion of the pelvis twice as long (or more) again the anterior portion, which he shades off during second part of the exposure with an implement ich he terms a "hatchet"—a sandwich of lead tween two pieces of three-ply wood mounted on handle, in shape something like a wooden fives-t with a large bite taken out of the far end. . Walton, possibly because he is content with 30-inch tube-film distance, does not consider is double exposure necessary, nor does he use a umb-line. Dr. Rowden's radiograms show the adow due to the ball-bearing of the Sectogrid aphragm and representing, of course, the normal ntral ray; its position may possibly serve as a ide to the amount of uncompensated distortion the edges of the film. After the exposure, the ight of the top of the symphysis pubis is measured: r. Walton takes the height to the film, but Dr. owden takes it to the diaphragm, fearing to introduce extra errors. Dr. Rowden claims to be able to measure this distance to within a quarter of an inch with callipers. The pubic scale corresponding to the measured height is attached to the film, and the measurements taken against it with callipers. Dr. Julius Jarcho,[4] another American worker, verifies the position of the inlet by measuring the distance between the spine of the fifth lumbar vertebra (marked with an adhesive tab) and the film, and the distance between the top of the symphysis and the film: the latter measurement is obtained by means of a plumb-bob attached to a support near the tube. After the patient has been radiographed, a second exposure is made on the same film through a thin lead plate punched full of small holes at intervals of exactly one centimetre, held on an adjustable stand in the same position as the plane of the inlet occupied before. Dr. Jarcho recommends an increase in the exposure corresponding to the degree of obesity of the patient and the amount of hydramnios. He also lays stress on the value of lateral pelvimetry for detecting disproportion between the fœtus and the outlet.

From the theoretical point of view, of course, these methods are open to the objection that the pelvic opening is not all in one plane. Moreover, unless the brim is quite parallel to the plate, a considerable error may creep in from the inclination of the true conjugate to the horizontal. Dr. A. Orley, in discussing Dr. Rowden's paper when it was delivered, pointed this out, and also that, as the transverse and antero-posterior diameters of the pelvis lie in different planes, they cannot be measured by a single projection. He measures the heights of the top of the symphysis and of the spine of the fourth lumbar vertebra (not the fifth, as in Dr. Jarcho's method), and the height of the postero-superior spine of the ilium; having radiographed the patient he superimposes two images of a perforated lead plate, one in the plane of the antero-posterior diameter and the other in that of the transverse diameter, the lead plate being turned through a right angle for the second exposure.

Measurements made by these methods are widely regarded as more accurate than the result of any clinical estimation. When, however, radiography is applied to the measurements of the fœtal cranium, there is room for some doubt, although if the radiographic examination is made within a fortnight of term the relative size of head and brim can be relatively gauged. Dr. Rowden gauges the size of the head by its probable distance above the brim, and Dr. Walton makes two exposures at right angles, in the antero-posterior and lateral positions, centring on the head as located by manual or radiographic examination, a method which is open to question as errors must produce distortion. Dr. Jarcho's use of adhesive marks and the pelvimeter sounds as though it should locate the centre of the head with as much precision as any other method. The obvious difficulty is always that small errors are easily magnified. Nevertheless, it is probable that radiology will be increasingly used for pelvic measurement, and also for the diagnosis of multiple pregnancy, monstrosity, and fœtal death, in which it has already shown its value. Under favourable conditions a positive diagnosis of pregnancy can be made radiographically from the third month.

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[2] Brit. Jour Radiol, September, 1931, p. 432.

[3] Surg, Gyn, and Obst, October, 1931, p 536.

[4] Amer. Jour. Surg., November, 1931, p. 419.

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"THE LITERATURE."

A SIGN of the times is the growth of an immense literature (so-called) at every point where scientific progress is being made. The evolutionary function designed by the producers is, doubtless, the formation of a base from which further to invade the unknown, and in so far as the granulation tissues of information are convertible into the permanent structure of knowledge, the writings satisfactorily serve this purpose. But one cannot help thinking that nowadays the proliferation has become a little pathological—a little malignant. Research workers, teachers, and learners are only too likely to waste their vitality in forcing their way through the unorganised masses of facts and fancies produced by those in front, and in all departments people are beginning to feel that they cannot cope with the task of being well-informed, even about their own subject. The conscientious teacher has the additional discomfort of feeling himself a humbug because his students assume that he is conversant with all the newest developments, whereas in reality it is quite impossible that he should be.

Any attempt to check the output of writing at its source must aim at removing its psychological causes, which are chiefly connected with the competition for priority and prestige, and the livelihood they may ensure. There is no doubt that if the problem could be attacked from this point it would be largely solved, for no one can fail to see that an enormous amount of work is prematurely published or purely repetitive. But a radical change of this kind is out of the question at present, and attention must be mainly directed to the devising of expedients whereby those new facts which are valuable are sorted out and made accessible to the specialist workers concerned. The three chief forms in which the material thus collected is given out again to those who need it may be classified as the tome, the review, and the abstract. Of these the two last are usually periodical at comparatively short intervals, while the first is only periodical at long intervals, in the form of new editions, or not at all. The tome thus rapidly becomes out of date—a criticism which we made a short time ago in reviewing a large new monograph on the vitamins, which is typical of the tome class. The tome may or may not be critically written; in proportion as it is critical and as the criticism is sound the book becomes more valuable. On the whole, however, it is in the two periodical forms that the greatest help is to be found. The review is critical, and selects for notice at regular intervals the salient advances made in the preceding interim period; but unfortunately this period may be of considerable length—even a year or two—so that there is a certain lag which is important to the research worker though less so to the teacher or learner. If edited with a sound critical judgment and power of selection the review should be the great standby of the teacher and the learner, and we are glad to notice that another periodical of this kind, the *Annual Review of Biochemistry,* is promised early next year. The panel of reviewers includes very distinguished names.

Finally, as we have said, the literature of a subject may be dealt with by means of the journal of abstracts, which is comparatively non-critical and essentially non-selective. It aims at being as complete as possible, and in appearing with as small a time-lag as possible; and though it is not outspoken in criticism, it is bound to develop subtle ways in which useful criticism can be conveyed, chiefly by a manipulation of phrases and by varying the amount of space devoted to particular pieces of work. Obviously it is as useful a function of a journal of abstracts to indicate to its readers which papers are not worth referring to in extenso as it is to make accessible to them brief and clear accounts of those which are—provided that the treatment is fair and broad-minded. The first number of such a publication has just appeared under the title of *Nutrition Abstracts and Reviews.* It is to be issued quarterly, but the first number is a double one, representing abstracts of papers which came out in the first six months of 1931. The delay in the appearance of the abstract of any given paper was therefore anything from five to eleven months, but it is hoped that when the journal has got into its regular swing this delay will be reduced to three to six months. The journal is sponsored by a committee of management representing the Imperial Agricultural Bureaux Council, the Medical Research Council, and the Reid Library, while the editorial staff is drawn from the Imperial Bureau of Animal Nutrition and the University of Aberdeen. The vitamin section is edited at the Lister Institute. The first number contains three excellent reviews on general aspects of nutrition by Sir GOWLAND HOPKINS, Prof. E. P. CATHCART, and Dr. J. B. ORR. The abstracts cover a very wide field, and make available work in a great number of journals to which the ordinary investigator has no access. Unimportant papers are noticed as briefly as possible, and the whole publication should achieve the aim of relieving the nutritional worker of an intolerable burden.

COMPENSATION TO A HOSPITAL.—The corporation of Bath having, under a local Act, taken compulsorily certain property of St. John's Hospital, a question arose as to the method of calculating the compensation, which was to be a capital sum which at 4 per cent. per annum would produce an amount equal to the average net annual income which would have been derived but for the passing of the Act. Upon a special case stated by the arbitrators, Mr. Justice Wright, in the King's Bench division, fixed the compensation at £26,875.

ANNOTATIONS

FOOD POISONING BY STAPHYLOCOCCI.

NTIL a few years ago the only bacilli conclusively ɣn to be associated with food-poisoning outbreaks ɜ organisms of the salmonella group and *Bacillus linus* in its several types. Others, such as *oli* and *B. proteus*, have been advanced to explain vidual outbreaks, but while their claims cannot lecisively refuted for every outbreak the evidence iminating them is always open to doubt and is n valueless. The prevalence of particular types ɔoisoning varies to some extent with locality, for le botulism outbreaks have usually been confined he Continent of Europe and to the United States merica, with only one recorded outbreak in Great tain, the ordinary form of food-poisoning in this ntry is due to salmonella, which is less common the U.S.A. It was to be anticipated that other terial types might cause similar attacks, and ly evidence has accumulated that certain strains staphylococci may do so. In view of their wide ribution in nature such a possibility deserves eful consideration.

n an outbreak of acute gastro-enteritis due to k in 1914 in the Philippines, M. A. Barber found the milk a white staphylococcus derived from the ler of a cow. He inoculated sterile milk with a e culture, incubated it for eight and a half hours l drank 50 c.cm. Two hours later he began an ack of gastro-enteritis, and next day he recovered. December, 1929, the consumption of a Christmas nge cake caused 11 cases of food-poisoning in icago, and G. M. Dack and co-workers[1] who investi-ted the outbreak found a yellow hæmolytic phylococcus in large numbers in the cake. This itself was not conclusive, but when the organism s grown in broth for 40 hours and filtered, 25 c.cm. the sterile filtrate produced a typical attack in a man volunteer, while smaller doses (5 and 10 c.cm. pectively) in two other volunteers produced only ght discomfort. This work was carried out in the icago University bacteriology department, and of. E. O. Jordan studied the possibility of other ains of hæmolytic staphylococci being able to oduce toxic substances. Fortunately he had abund-ce of human volunteers (about 58), and some 80 ding tests were carried out with sterile filtrates. ost of the staphylococci tested had toxigenic operties, including three from normal human roats and three from food implicated in food-isoning outbreaks. Filtrates from 48-hour cultures ere as toxic as those from seven-day cultures and e symptoms were often severe, but recovery was ways prompt and complete. A third outbreak is w described by Jordan[2] associated with cheese Porto Rica. From this he isolated a yellow aphylococcus, and filtrates of broth cultures repro-uced the symptoms of food-poisoning in three uman volunteers. With J. R. Hall[3] he has reported fourth outbreak in which a man and his wife eveloped severe symptoms about three hours after meal in which the peccant food was chicken gravy. culture of the *Staphylococcus aureus* type was olated, and filtrates of pure cultures reproduced he symptoms in four out of six human volunteers nd with an incubation period of about three hours. Lastly, in his latest paper,[2] he gives details of five other outbreaks, in one of which the ætiological association was proved by the employment of human volunteers, while in the other four the evidence was suggestive, but similar proof was not forthcoming.

This important series of investigations, mostly emanating from the Chicago University bacteriology department, has clearly demonstrated that certain staphylococci must be accepted as causing food-poisoning. The symptoms are of the gastro-intestinal type, the incubation period is short (two to four hours), and so far no deaths have been recorded. On the bacteriological side Jordan remarks that these staphylococci "do not seem to differ in their main cultural characteristics from the common and widely distributed members of this group. Both *albus* and *aureus* varieties are found among the strains yielding toxic filtrates." The human experiments show that the sterile filtrates are toxic. The resistance to heat of this toxin is of no little practical importance, and the earlier evidence was to the effect that it was destroyed by boiling and weakened at lower temperatures (60 to 65° C.). More recently, however, Jordan, Dack, and O. Woolpert[4] have revised this opinion, and conclude that the toxic substance is not completely destroyed by exposure for 30 minutes to the temperature of boiling water. This point cannot be considered settled. It is one of some difficulty, for the lower animals, even monkeys, have proved unhelpful in this work. Results can be satisfactorily obtained only by the use of human volunteers, and the experiments so far carried out show that individual susceptibility is variable. The question arises whether artificial protection is possible, and the last-named workers have attempted to immunise human volunteers with these toxic staphylococcus filtrates.[5] Some degree of tolerance appeared to develop, but there was no sign of the formation of any true immune bodies. Repeated attacks of gastro-intestinal disturbance may be produced in the same person by successive feedings.

We congratulate the Chicago school upon a series of brilliant investigations, and upon the recognition of another bacterial cause of food-poisoning—one which may in future explain a number of outbreaks whose cause would otherwise be obscure. While unable to repress our envy at the opportunities for experimental work, we must offer full meed of praise to the long tale of human volunteers (over 100) who have so willingly poisoned themselves with staphylococcal filtrates.

BACTERIOLOGY OF RHEUMATOID ARTHRITIS.

THE appearance, at fairly regular intervals, and more frequently in America than elsewhere, of papers relating streptococcal infection to polyarthritis emphasises the fact that most bacteriologists fail to reproduce the successful findings of the few. The relative ease of procuring positive blood cultures in malignant endocarditis, and even of growing gonococci from cases of gonococcal arthritis, contrasts with the negative findings which are the lot of most routine workers in the culture of blood and joint exudates in the disease variously known as polyarthritis, rheumatoid arthritis, and arthritis deformans. However, one positive result is worth a dozen negatives;

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[1] See THE LANCET, 1930, i., 1354.

[2] Jour. Amer. Med Assoc., Dec. 5th, 1931, p. 1704.

[3] Jour. Prev. Med., 1931, v., 387.

[4] Ibid., p. 383.

[5] Ibid., p. 151.

and the claims made deserve serious consideration. The work of Cecil and his co-workers[1] attracted attention to points of technique; in particular the long period allowed for the development of positive cultures (up to one month) and the frequent subcultures were open to criticism, since contamination was to be suspected. Cecil claimed positive findings in 62·3 per cent. of cases. The question obviously resolves itself into one of technique, and it has been reopened by a paper from the arthritis clinic of St. Barnabas, New Jersey, by Gray and Gowen.[2] They modified Cecil's method slightly, with the surprising result that cultures were found to be positive, in much the same percentage of cases, but within one to four days, instead of a month. The essential feature of Cecil's technique was the culture of blood clots, separated from the serum and its inhibitory elements. The modifications consist of the addition of gelatin "to create oxygen tension," calcium carbonate, and glucose. Armchair criticism would admit that clot culture might well succeed, since serum is undoubtedly inhibitory, and the successful culture of blood in distilled water is due to its dilution. Beef broth contains about 0·2 per cent. of glucose; the calcium carbonate is merely a buffer, and gelatin is not traditionally used for modification of the oxidation potential of fluids, which is more readily achieved by glutathione. Prima facie, the change would not be expected to produce the startling acceleration of positive results with which it is credited.

The organism is said to be a streptococcus of *viridans* or α-hæmolytic type, producing green discoloration on blood media. Therapeutic results with vaccines are stated to be remarkably good. Of the 48 cases cited in the protocol all were bettered, the remarks varying from "astonishing improvement," through "cured" to "improved." Certain results, however, require explanation. Astonishingly high agglutination titres are claimed from the blood of infected cases; up to 1 in 5120. Such a titre would be outstanding even in an experimental animal, and no details are given of the technique used and how auto-agglutination—the bane of streptococcal agglutination—was overcome. Moreover, the paper seems too rich in negative controls, 106 in all. The streptococcal theory of arthritis goes hand in hand with "focal sepsis," and some of the cases of chronic sinusitis and chronic tonsillitis should have given positive results. Incidentally, 17 cases of osteoarthritis were negative.

There are two aspects of rheumatoid arthritis, both of the utmost importance, but quite independent of each other. For ætiology and therapeutics are, unfortunately, not yet inevitably associated. Vaccine therapy is going through a lean time, and streptococcal vaccines in general are failing to commend themselves. The tendency of rheumatoid arthritis to spontaneous amelioration is well known; it is a disease of exacerbations; often it runs an acute course and is not progressive after its early mutilating crisis. If the 48 cases of amelioration were attributable to the vaccine they have little analogy with vaccine therapy in general. Cultural experiments, however, deserve and will doubtless receive careful consideration. Full technical details are given in this paper, and the claim of the authors in support of Cecil's work can easily be confirmed or repudiated. It is to be hoped that the investigation will be repeated in t country.

A NEGLECTED MEDICO-LEGAL PROBLEM.

THE fugue described by Dr. Chambers and Dr. Harrowes elsewhere in this issue recalls N. Vinci's recent account[1] of loss of personality in a boy of 12 whose case was remarkable in that the memories of his lost self could be minutely recalled under hypnosis. but for some months did not enter the waking consciousness. It is obvious that modern psychological technique can be applied to these cases both for therapeutic purposes and to establish their genuine nature, and in face of the numerous cases of "loss of memory" that are reported in our newspaper this fact should be more widely known. The con dition is one that cannot be diagnosed in the absenc of expert examination, and an instructive note i the account of the Perth case is the difficulty i convincing the police that the case was genuin Their conversion is described by the writers, and the patient had *actually committed some* breac of the law the evidence of the two psychiatrists migl have been sufficient to protect him from punishmei while he was still in a fugue state. There can l little doubt that such a fate befell the victim of tl case at Hove that aroused protests in our corr spondence columns last August, and it appears us discreditable to the professions of law a medicine that there is no security that similar cas will receive the skilled attention that happened be available for this one fortunate sufferer.

ÆTIOLOGY AND TREATMENT OF WHOOPIN COUGH.

WHOOPING-COUGH has long defied both bacter logists and clinicians. The former do not definite agree about the precise nature of the causal agent, while the latter are faced with difficulties in early diagnosis and have no accepted and effective plan of therapy. The paper by Dr. Gardner and Mr. Leslie, published at p. 9, is timely: first, because it emphasises the importance of the disease as a cause of infant mortality; and, secondly, because it contains bacteriological information not generally available. Since 1907, when Bordet and Gengou described a small Gram-negative bacillus now known as *Hæmophilus pertussis* in infected cases, there has been much controversy about the ætiological relationship of this organism to the disease. The difficulty has been its isolation and differentiation from Pfeiffer's bacillus. Some years ago, however, as Gardner and Leslie tell, Madsen and his colleagues in Denmark introduced the "cough-droplet method," whereby it can be isolated in as many as 75 per cent. of cases in the first week of the disease, and these results have been confirmed not only in England by Sugare and MacLeod, but also in America, where positive results up to 93 per cent. have been obtained in the early stages. This method ought to be much better known because of its value at the onset of the disease, before paroxysmal coughing begins; but even at this stage it must, of course, be remembered that a negative result is not conclusive. Moreover, at least three days must elapse before a positive result can be given, and Gardner and Leslie possibly underestimate the difficulty of bringing the test into general use outside large towns. As we have said already, only positive lts would be of value, and anyone who has ked at isolating *H. pertussis*, and knows the culties connected therewith, will appreciate the ıber of additional adverse factors which would ıe into play when such work was removed from immediate confines of a well-equipped laboratory. perience has also shown that it would not always easy to ensure that the plates returned had been cted in the proper manner during a natural ack of coughing, but this objection should not, course, arise where practitioners are able to ervise the taking of the culture. In the later ges of the disease, after about the third week, chances of finding the Bordet-Gengou bacillus extremely remote, and it appears that patients definitely non-infective after the sixth week. rdner and Leslie advocate the use of specific cines in prevention and cure, but here again must be borne in mind that the employment of cines in the prophylaxis and treatment of whooping-gh has so far shown little or no promise of success. bably the organisms used for these vaccines were and not in the correct antigenic phase, and haps further trials with recently isolated strains h the antigen in Phase I. will be more fruitful. nilar results to those of Gardner and Leslie have n obtained by W. A. McGee,[2] who has also con-ered the treatment of established cases of whooping-gh. He found that while ephedrine was more ful than the usual cough sedatives, rectal ether—t recommended by C. L. Elgood in England—gave tstanding results. The ether is administered with ual parts of olive oil (except to infants under one ar of age, who are given 25 per cent. ether in double sage), and the dose is 1 drachm per year of age, en twice daily through a soft rubber catheter. It claimed that freedom from severe paroxysms and miting may be obtained within a week.

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[1] Cecil, R. C., Nichols, E. E., and Stainsby, W. J.: Arch. Int. Med., 1929, xliii, 571.

[2] Gray, J. W., and Gowen, C. H.: Amer. Jour. Med. Sci., 1931, clxxxi., 682.

[1] Canadian Med. Assoc. Jour., 1931, xxv., 147.

THE INHERITANCE OF INTELLIGENCE.

Dr. Evelyn Lawrence has made a new contribution [3] the old controversy on nature versus nurture, r special problem being the relative importance of redity and environment in determining the level intelligence. For this purpose she has applied telligence tests to a considerable number of children awn from various institutions and schools, relating e results to the social class of the parents—a iterion of intelligence whose inadequacy she recog-ses. As regards the distribution of intelligence r observations are in keeping with those of previous vestigators. As we go down the social scale from e higher to the lowest classes the intelligent quotient adually shifts over from above the 100 level to nsiderably below it. There has, however, been ttle clear evidence hitherto to explain how these fferences of level arise, how much they are due to herited differences, and how much to the immense vironmental differences. Dr. Lawrence finds a rrelation between the intelligence of children and e social class of their parents when they have never en those parents, but have been brought up in stitutional life. This is "fairly conclusive evidence," he says, "that the correlation so generally found r children in their own homes is not mainly due o the direct social influence of the home, but is a enuinely biological fact." On the other hand, the correlation she finds is by no means a high one—it is of the order of 0·2 to 0·3—so that inheritance is by no means necessarily the only, or even the dominating, factor. She herself concludes that the association is rather smaller in the case of institution children—the figures in support are not very convincing—and that "there is little doubt that environmental conditions have some weight in influencing the response to tests." A further test was made by the comparison of children taken away from home at an early age with those in the same institutions who were removed from their parents later in life. The figures suggest that the correlation between the child's intelligence and the social status of the parents is somewhat less among those who entered the institution earliest in life, but it is very doubtful if these differences are significant. They are not supported by the fact that the children taken from bad homes to institutions showed almost no increase of intelligence with the improvement of their surroundings. There was also little difference in variability between the children in the uniform environment of the institution and those in their own diverse homes, though if environment can affect intelligence scores we should certainly expect children reared in an institution to be more alike than those brought up in the widely varying surroundings outside. Various health-ratings, such as height-weight index and nutrition, were correlated with intelligence without significant result.

With such small correlations between intelligence of child and status of parents any generalisation about social classes is a hazardous business. Dr. Lawrence concludes that "for any definite plans for social reform based upon the differential inheritance of intelligence, social class is not a satisfactory grouping. Either some basis of classification resulting in more homogeneous and more widely differentiated groups needs to be found, or we must realise that the only safe unit by which to assess intelligence is the individual, or at most the family."

OCULAR PLUMBISM IN CHILDREN.

LEAD poisoning in children must be extremely rare in England, but in certain parts of Australia it is, it seems, not uncommon. Mr. J. Lockhart Gibson, consulting ophthalmologist to the Brisbane Hospital for Sick Children, who has been writing about this condition at intervals for the last 30 years, points out [1] that in Queensland houses are commonly built with verandas, whose railings are of wood, which, especially in the neighbourhood of towns, is usually painted with white lead paint. In that semi-tropical climate the sun soon converts this paint into a powdery substance which rubs off easily on the hands, and this has been found to be a soluble carbonate of lead. In the summer young children spend a large part of their time on the verandas, and Mr. Gibson observed that the children in the families who became affected with lead were generally in the habit of biting their nails or sucking their fingers. It may be remembered that in writing on the incidence of chronic nephritis among these children, L. J. J. Nye mentioned that there is a local pastime of licking the raindrops from the veranda railings.[2] Cases of wrist-drop and foot-drop were first described in Queensland children in 1892. Ever since 1897 Mr. Gibson has come across cases of paralysis or paresis of the external recti, combined with papillœdema, and this he regards as an early, and therefore important, sign of lead poisoning. In the early cases the child hardly appears to be ill, and the condition would be unrecognised by the parents were it not for the sudden and fortunate appearance of a squint. In severe cases the patients are so ill that they are confined to bed, and are thus removed from the further ingestion of lead, but damage to vision from post-papillœdemic atrophy may readily take place unless, he says, a timely lumbar puncture is done. These cases result from a comparatively large quantity of lead being ingested in a short time. The pathognomonic blue line on the gums and other typical symptoms do not have time to develop, but lead can be discovered in the urine. The cause being removed, the essential treatment in cases with papillœdema is a prompt lumbar puncture. If the intracranial pressure is in this way returned to normal sufficiently soon, recovery, in Mr. Gibson's experience, is certain; otherwise blindness may ensue. The ocular paralysis is always recovered from. He adds that a good substitute for white lead in paint is zinc white, which, he says, lasts longer on exposed surfaces.

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[2] Jour. Amer. Med. Assoc., 1931, xcvii, 922.

[3] An investigation into the relation between Intelligence and nheritance. By Evelyn M. Lawrence, B.Sc., Ph.D. Brit. Jour. f Psych., Monograph Suppl. No. XVI. Cambridge University ress. 1931. Pp. 80. 8s. 6d. net.

[1] Brit. Jour. Ophthalmol., November, 1931, p. 637.

[2] See THE LANCET, 1929, ii., 830

OFFENSIVE BREATH.

HALITOSIS, as it is called politely, is one of those minor disorders that make life a misery. When aware of it the sufferer can easily develop serious depression and a painful sense of inferiority. To prevent such a misfortune the courteous Japanese, it is said, consider it good manners to inhale continuously through the mouth (like an inverted ostler) during propinquity with a stranger's breath; whereby they mean to imply that nothing could be sweeter. Even we, in relatively barbarian lands, will suffer much before mentioning fœtor oris to our friends, and often perhaps this is kind only to be cruel. The medical practitioner, at any rate, should be very ready to consider and deal effectively with any such disability encountered in a patient, and he must certainly be the last to dismiss it as trivial because the cause is not apparent. First he will probably, and rightly, think of the mouth, and it is interesting to find that H. Prinz,[1] reviewing the subject as a dentist, attributes offensive breath in at least 90 per cent. of all cases, to prolonged stagnation of food debris about the teeth. Both carbohydrate and protein may undergo decomposition in cavities and crevices around the teeth, and any actual pyorrhœa or exposed gangrenous tooth pulp increases the odour. That food debris alone is often responsible is shown by the fact that artificial dentures which are not kept perfectly clean may become quite definitely offensive though their owners are edentulous and have no gingivitis. Wherever, therefore, there is bad breath most careful search is necessary for evidence of dental sepsis or carelessness in removal of food debris by frequent cleaning—though there is always a danger that vigorous brushing with a hard brush may damage the gums and allow organisms to enter the tooth margins.

After the teeth the next commonest source of fœtor oris is probably chronic pharyngitis and tonsillitis. The tonsils may appear normal on superficial examination, but more thorough search may reveal crypts containing cheesy and highly offensive material which is the cause of the smell. This is a very important condition which may only respond to tonsillectomy, though local application of silver nitrate to the crypts is some effective. Chronic sinusitis is more usually productive of a bad taste noticed by the patient himself than of any marked fœtor in his breath; atrophic rhinitis or ozæna is, of course, a recognised though luckily rare, disease in which the breath is particularly foul. Informed opinion has i that digestive disorders less often cause offensive breath than might be expected—gas brought up from the stomach directly by belching is usually odourless, but may sometimes have a smell of fermentative fatty acids or hydrogen sulphide. This, however, is the smell of flatulence and not of ordinary breathing. Quite different is the origin of substances absorbed from the intestinal tract and excreted by the lungs, but with experience of onions and alcohol, it is easy to imagine that tainted breath is very often due to alimentary putrefaction. Thus, it is generally believed that constipation is pretty commonly responsible. But those best qualified to judge seem to think that the products of abnormal bacterial fermentation seldom travel from the colon to the breath unless there is actual disease of the mucous membrane. Constipation, they say, is not often to be blamed for offensive breath, notwithstanding the widespread belief to the contrary; enteritis is a more frequent cause than colitis, gastritis—in the absence of pyloric stenosis—less common than either.

There is no need here to do more than mention the kinds of offensive breath encountered in chronic pulmonary disease, the characteristic smells associated with uræmia, and diabetes, or the odours said to be recognisable in certain fevers and—especially by animals—when death is imminent. The problem with which we are concerned is the problem of the ambulant man, woman, or child whose trouble may be a source of much distress. In far the greatest number of such cases fœtor oris has its origin in the teeth, tonsils, nasopharynx, or respiratory tract in only a relatively small proportion is it traceable to metabolic or digestive disorders. Treatment and prevention must thus mainly be directed to the local conditions around the oral cavity, and it is correspondingly unwise to begin by concentrating one's attack on liver and bowels.

HUNGER AND THE NERVOUS CHILD.

THAT nervousness in elementary school-childre is definitely related to hunger and diet is the conclusion of D. A. Laird, M. Levitan, and V. A. Wilso who describe their investigation in a preliminary repo dealing with certain groups of American school-children.[1] Recognising that the term "nervousness" describes a wide range of conditions and behaviour, they allowed the school-teachers to select those children regarded as the most nervous in the educationist's sense, and then measured their nervousness according to a "check list" described by W. C. Olson. The 53 children thus selected were free from all signs of malnutrition and obvious physical disorders. One group received half a pint of milk at 9.30 every morning for five days each week, this time being selected because it was found that few of them had much breakfast and that even when this was at all adequate it had usually been taken at 7 so that the stomach was empty by 9.30. In another group a food concentrate was added to the milk to supply extra calcium so that at least one gramme of calcium was obtained daily—this being regarded as the minimal require-t of the growing child. The food concentrate contained vitamin D and phosphorus, since these ; considered essential for the utilisation of calcium, lactose instead of cane sugar was used as a tening agent because it is believed to facilitate ıbsorption of the mineral. A group of ten nervous lren received no extra nourishment, merely ing the class-rooms with the others and being to play with toys until it was time to return ther. Although closely coöperating in the work, teachers were kept in ignorance of the procedure : the children had left the class-rooms, and they not know which of them received special diets. y were thus in a position to judge the results. control group showed an improvement of just : 2 per cent. in nervousnesss at the end of a two-k period, as measured by the check list, possibly ıuse of the personal attention given them. Those iving the extra milk showed an 8 per cent. improve-.t, but in three directions the improvement was ıuch as 25 per cent.—i.e., they were to this extent easily fatigued, more even-tempered, and less ommunicative. Those receiving the food con-trate in addition to the milk showed an average rovement of over 15 per cent. In discussing results the investigators claim that the success he milk feeding is due to the removal of hunger ıs, since the active peristalsis of the stomach ch takes place during hunger is liable to cause lessness and irritability. The influence of calcium n the activity of nerve and muscle is held to explain beneficial results of adding it to the diet. In a more oorate experiment lasting two months the food centrate was given for the second only of four nightly periods when milk was given. The rovement brought about during the calcium night was slowly lost after the calcium was omitted. rd and his colleagues think that the calcium tabolism needs to be attended to consistently her than sporadically. They hope that their ılts "may help to convince school board officers l others who are not yet convinced of the importance school lunches for children that the necessary ds be provided and neurosis in this class of children sened and possibly prevented."

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[1] Brit. Jour. Dent. Sci. and Prosth., 1931, lxxvi, 231. (Reprinted from Dent. Cosmos., 1930, lxxii, 700.)

[1] Med. Jour. and Record, Nov. 18th, 1931, p. 494.

W LIGHT ON POST-OPERATIVE ATELECTASIS.

POST-OPERATIVE atelectasis, though seldom fatal, y be the cause of severe distress to a patient who s not yet recovered from a severe laparotomy, and embarrassment to a surgeon who has just been ıgratulating himself on the success of a difficult eration. Its onset is usually preceded by bron-itis associated with the expectoration of viscid utum. The symptoms of an acute respiratory sis (dyspnœa and cyanosis) which follow are evi-ntly the result of a blockage of bronchi by accumu-ed secretion. As in other types of bronchial struction stagnant air in the lobe normally supplied the affected tubes is removed by way of the blood ream. At the same time the movements of the uscles of the chest wall and of the diaphragm are nited on the affected side, a disability formerly held be the cause and later commonly regarded as the sult of the underlying collapse. Dr. C. M. van llen [1] [2] now shows that both factors are concerned—ıat though restricted respiratory movements when ıe airway is patent do not result in atelectasis, a paresis of the diaphragm plays a not unimportant part in its production after abdominal operations.

There appears to be in the lungs a collateral air circulation analogous to the collateral circulation of the vascular system. Collateral air circulation is possible because the interlobular septa are incomplete and alveoli of neighbouring lobules communicate with each other by minute stomata. In van Allen's opinion, massive atelectasis is due to the association of bronchial blockage with failure of this collateral respiration. He holds that such a failure is often due to diaphragmatic inertia, and adduces three groups of experiments in support of his theory. During radiographic examination by means of a double exposure it is possible to record the position of the diaphragm in full inspiration and expiration, the amplitude of its movements being thus clearly shown on one film. A large series of films taken in this way showed abdominal section to be followed by considerable reduction of the range of excursions of the diaphragm, though there is only slight limitation of rib movements. There was no such limitation of movement after operation on the extremities, and we must therefore assume that trauma of the abdomen is a cause of feeble muscular action which may militate against adequate ventilation of the lung bases. A second series of experiments made on dogs proved that though deflation of a lobe follows ligature of the main bronchus supplying it, lobar collapse does not occur if the constriction is applied immediately distal to the first lateral branch. If this remains patent the collateral air circulation comes into play and air percolates from the area surrounding the branch through the rest of the lobe and maintains its expansion. The efficiency of the collateral respiration is dependent on the depth of breathing and is markedly diminished, for example, when the animal is deeply anæsthetised. A tight costal bandage does not hinder air circulation, for the diaphragm is not affected, but an abdominal binder firmly applied interferes with the movements of the midriff and decreases collateral circulation, while section of the phrenic nerves abolishes it. In a third series of experiments the stem bronchus of an accessory lobe was ligatured and the lobe became completely atelectatic. At the same time a ligature similar to that performed in the second series of experiments was applied to the stem bronchus of a lower lobe. In this lobe collateral circulation prevented collapse, though radiograms taken after the injection of lipiodol showed that there was effective bronchial obstruction in the area which had profited by the collateral aeration.

The conclusions drawn from careful experiment thus seem to warrant the belief that abdominal operations have an adverse effect on diaphragmatic movement and hence on the efficiency of collateral respiration. Plugging of bronchioles by tenacious phlegm would in these circumstances result in lobular atelectasis and an aggregation of lobules thus affected might produce lobar collapse. Such collapse also follows the plugging of a main bronchus, but in post-operative conditions this is presumably less likely. Van Allen believes that post-operative diaphragmatic inertia is due to reflex inhibition, the result of irritation of the lower intercostal nerves. This theory finds some support in the observation that a temporary elevation of the diaphragm sometimes follows injury to the chest wall; an example of such a sequence was recently described in our columns.[3]

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[1] Van Allen, C. M. and Jung, T. S.: Jour. Thoracic Surg., 31, i., 3. C. V. Mosby Co., Pine Blvd., St. Louis, U.S.A. -monthly.

[2] Van Allen, C. M.: Jour. Oriental Med., 1931, xv., 83.

[3] Wood, W. Burton, and Wood, Franklin G.: Congenital Elevation of the Diaphragm, THE LANCET, 1931, ii., 392.

Experimental stimulation of the distal ends of divided intercostal nerves has produced a similar condition. It seems unlikely that the pressure of an ordinary abdominal bandage would be sufficient to produce the effects obtained in dogs subjected to experimental abdominal pressure, and further investigation of this problem is proposed. Meanwhile, however, a practical deduction may be made. Post-operative atelectasis is associated with a sluggish action of the diaphragm. Deep-breathing exercises, by encouraging diaphragmatic excursion and the movements of the lower intercostal muscles, will tend to preserve the collateral respiration, and thus obviate the ill-effects of mucoid plugs in the bronchioles. Such exercises have already been practised in certain institutions, and their employment should be encouraged so far as the patient's condition and the nature of his wounds permit.

We welcome Dr. van Allen's observations all the more because they come unexpectedly from the distracted country of Manchuria, where he holds a chair of surgery. And we take this opportunity of wishing success to the new *Journal of Thoracic Surgery* in whose first number his principal paper appears.

PROGNOSIS OF DIABETES IN CHILDHOOD.

A GLOOMY picture of the future of the diabetic child is painted by L. Salomonsen,[1] who at the end of 1930 inquired into the fate of 68 children treated at the Rikshospital in Oslo between May, 1923, when insulin was first introduced, and December, 1927. Thirty-five were found to be dead, the cause of death being diabetic coma in 31 cases, and intercurrent disease in the other four. A classification of the children, according to duration of life after the institution of dietetic and insulin treatment, brought out the interesting fact that those who died did so *often after a comparatively short interval.* Only two of those who died had been ill for over four years, and many of the early deaths were clearly due to the inability of the parents to carry out the treatment prescribed. The ten children who, for one reason or another, were never given insulin, all died. Of the 38 children to whom insulin was given, but without adequate dieting or skilled medical supervision, 18 died. On the other hand, of the 20 children systematically kept under observation, with strict dieting and sustained insulin treatment, all but five survived, and in considering these figures it is important to remember that although insulin treatment began in 1923, it was for the first few years extremely restricted in every respect. Only very small amounts of insulin were given, and the diets were correspondingly small. Insufficient food matters far more to children than to adults, but during the last few years only has it been recognised that large doses of insulin which allow of diets sufficient for normal growth and activity must be given to diabetic children if they are to develop normally. When looking to the future we may ignore all the cases in Salomonsen's series except the last group of 20. And even here the mortality of 25 per cent. within four years is not at all what may reasonably be expected nowadays. The ability to use insulin to the best advantage is still increasing, and the death-rate should yet be much reduced. Two years ago we commented [2] on the more encouraging results obtained by E. P. Joslin at the Mayo Clinic, where 147 out of 164 cases treated since 1923 were still alive in 1928. A analysis of the cause of death in the 17 fatal cas showed that in eight of them insulin treatment w either not used or was suspended for one reason o another, while in four others the disease was allowe to get out of control. It is not too much to say th the future of the diabetic child is hopeful, in so far a insulin is used to the fullest advantage. In England at any rate, many of the older physicians in practice away from hospitals have necessarily had very litt experience of insulin, and so when the treatment o the *diabetic child is under discussion the question i* still frequently heard: Is it really worth it? Tho who have encountered some of the healthy happ diabetic children whose disease brings hardly an disability will probably answer, Yes. Pessimism wi gradually disappear with the spread of knowled beyond the diabetic clinic, and as it spreads th future of the diabetic child will *become steadi* brighter.

HEAT CRAMPS.

THE peculiar condition of cramp in the muscl experienced by men working in high temperature has been *known for many* years. Its chief cause seems to be high temperature associated with high humidity and low air velocity—in other words, interference with loss of body heat. The next most important factor is muscular effort, while a third is the physical condition of the worker. Cramps seldom afflict men working in the open air, however hot it is; *they are usually in the* muscles most vigorously used, and they are most often found in men who have insufficient sleep or food, or too much alcohol, or some intercurrent disease. Moreover, inexperienced men starting on hard work in the heat are especially liable to cramp. Dr. D. M. Glover, who reviews these facts,[1] says that it is the spare, wiry *men* who are most often affected, and that he has never seen a case in an obese person. Twenty-five years ago cramps were believed to be due to the drinking of iced water, and many steel mills supplied tepid water only. Possibly this discouraged the men from drinking large quantities, but otherwise the measure could have had little effect. The theory *that cramp* is due to salt loss is attributed to J. S. Haldane, but salt solution had been used empirically some years before he made the suggestion of giving sodium and potassium chloride in the drinking water. The results proved extremely gratifying, and Glover's recent observations confirm these earlier findings. When the water is salted the men drink less and less often, he finds and yet their thirst is quenched. The trouble has been that salty water is disagreeable to the taste and men often will not drink it consistently. Glove therefore hit on the idea of supplying a salt table to be taken with each drink. Since the worker lose 2 or 3 g. of sodium chloride in an hour of har work, a grs. 16 tablet of sodium chloride was recommended. This is only slightly larger than the ordinar aspirin tablet, and has been found to compensate th salt loss adequately. Glover points out the importance of making everything as simple as possible men will not take trouble, even to save themselve cramp, and they will not go and ask the foreman fo tablets lest they should seem to be complaining o unfit *for* their work. It was therefore arranged tha each drinking tap should have over it a machin delivering one tablet by some simple mechanism-ally a rotating plate. Dr. Glover is unable to duce convincing statistical evidence of the freedom m cramp afforded by this simple means, but he is isfied that the method is well worth introducing any factory where men have to do hard muscular rk at high temperatures.

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[1] Tidsskr. f. d. Norske Laegeforening, Nov. 15th, 1931.

[2] THE LANCET, 1930, i., 362.

[1] Jour. Indust. *Hyg.*, December, 1931, p. 347.

THE DANGERS OF MOTOR TRAFFIC.

WE have received from the Pedestrians' Association tatement in support of the contention that roads are wing increasingly dangerous to pedestrians owing motor traffic, the view being based upon the first urns under the new Act abolishing speed limit. far as London is concerned the road casualty urns for the metropolitan police area during the st nine months of 1931 show a decrease compared th the corresponding period of 1930, but the sociation considers that conclusions based on the ures for a single area, however large, taken over a atively short period, might be illusory. Despite e metropolitan experience, as shown by figures, e *Association holds that the roads generally throught* the country have become more dangerous for the lking public, and that the flattering message sugsted by the comparison of the first nine months 1930 (1021 deaths) and the first nine months of 31 (963) has an obvious explanation ; there was, e Association points out, a great decrease in the mber of mechanically propelled vehicles in the er year. The figures of the annual census ken by the Automobile Association, and a return the Ministry of Transport are quoted in support this statement, and it is asked pertinently whether detailed analysis and comparison might not reveal relative increase in the casualties. The conclusion the Association, which admits the impossibility of ing precise, is that during 1931 the roads became r the walking public at least 10 per cent. more ngerous, and, while it formulates no conclusions ncerning the attitude of motorists under the new gime, the statement implies that there has been an thinking adoption of the new standard of increased eed. A decrease in motorists' casualties is certainly t consoling to pedestrians ; it suggests that otorists are becoming more careful to avoid accints likely to involve danger to themselves while owing in recklessness towards the pedestrian. he statement issued by the Pedestrians' Association scloses a serious state of affairs, and makes the rminal question in the document reasonable. conditions have become so much worse in normal year of reduced traffic, what will ppen when traffic resumes once more its normal evelopment ?

The Marylebone branch of the British Medical ssociation is holding a meeting to discuss "the ischiefs of motoring" under the chairmanship of ir StClair Thomson at 11, Chandos-street, on an. 27th, when it is to be hoped that the question f the attitude of the drivers of motor-propelled ehicles in regard to pedestrians will be discussed eriously. That the carelessness or confusion of the edestrian may contribute to the number of the atastrophes no one denies, but the assumption is oo often made that the blame lies with the pedesrian. It is an effort of the imagination to describe n inquest connected with a motor catastrophe as n opportunity for a jury to describe a pedestrian s a "jay-walker," and to sympathise with the notorist in his painful regrets, but the description is ot a very violent effort.

THE POSITION OF THE ROYAL INSTITUTE OF PUBLIC HEALTH.

THE Royal Institute of Public Health is compelled to vacate its home in Russell-square, and the acquirement of new premises has become imperative ; the Institute, further, is committed to a scheme of rebuilding inaugurated before the present financial stringency. The site in Russell-square will be utilised by the University of London, where street widening does not absorb it, and the Institute has acquired a freehold site at a cost of £19,256 on the north side of Queen-square, Holborn. The estimated amount required for the erection and equipment of the new building is £30,000, and the Institute has no endowment, and is without funds or income further than its receipts in fees and contributions from public authorities for investigations and analyses. Hence the need for an appeal to the general public who have benefited from the long-standing labours of the Institute, and it may be added here that the principal officials—the Principal, Treasurer, Counsel, Solicitors, Auditor, and Secretaries—act in an honorary capacity. The great claim of the Institute on public support in the crisis is its pioneer activities for the standardisation of health service throughout the country. It started in an unpretentious way with the recognition by a small group of medical practitioners of the doubtful value of certain Diplomas in Public Health granted by universities and medical corporations, inasmuch as they did not form a registrable qualification, and it was decided to form a society with the object of promoting legislation on the subject.

The new Institute was born and its great achievement followed, by the securing of a statutory provision that the possession of the "Diploma in Public Health" (D.P.H.) should be rendered compulsory upon all seeking to hold office as medical officer of health under public authorities. The General Medical Council accordingly undertook the standardisation of the various D.P.H. diplomas ensuring uniformity in the examinations. The Institute proceeded to provide a fully equipped centre for compliance with this curriculum, and in a report to the University of London the G.M.C. Inspectors stated that this was being successfully done. As a matter of fact, since 1886 over 1000 medical practitioners have received training at the Institute, the percentage of success of those presenting themselves for the Diploma in Public Health being as high as 85. Royal recognition was obtained in the Jubilee year of 1897, when Queen Victoria conferred upon the Institute the title of Royal and became its Patron —a position subsequently held by their late Majesties King Edward VII. and Queen Alexandra, and now held by their present Majesties.

The President and Secretaries of the Institute will furnish any information required, and we are asked to state that the cheques of donors to the appeal for funds should be made payable to Lord Meston, Chairman of the Appeal Committee, and crossed "Barclay's Bank, Ltd., Russell-square Branch."

NORTH KENT MUTUAL HOSPITAL ASSOCIATION.—At the recent inaugural meeting of this association at Gravesend it was explained that by means of fixed annual or other periodical payments regular subscribers will obtain institutional treatment without trenching upon the funds of the North Kent Hospital. The income limits of the scheme are as follows : Single man or woman, widow or widower, £200 to £350 per annum ; married man and wife, £250 to £400 ; married man, wife, and children under 16 years of age, £300 to £500. There is a uniform contribution of 6*d.* per week or 1 guinea per annum.

SPECIAL ARTICLES

THE RÔLE OF VIRUSES IN THE ÆTIOLOGY OF CANCER.

LATER DEVELOPMENTS OF DR. GYE'S WORK.

By W. CRAMER, D.Sc., M.R.C.S.,
IMPERIAL CANCER RESEARCH FUND.

A RECORD has now appeared of the experimental work carried out by Gye and Purdy during the past six years and devoted to a study of the filtrable tumours of fowls, and in particular to the nature of the infective agent by which these tumours can be transmitted.[1] More than three-quarters of the book are taken up by a detailed account of the experimental work and a discussion of the results. The experimental work is introduced by two preliminary chapters, the contents of which can best be summarised by the headings given by the authors to these chapters. The first heading reads: "The cancer problem as revealed by the facts already established concerning tumours of man and other mammals." The second chapter is entitled: "The cancer problem as revealed by the facts already established concerning filterable tumours of the fowl." In this way the various problems presented by the filtrable fowl tumours are clearly set out. They may be summarised as follows. What is the nature of the infective agent capable of transmitting these fowl tumours in a specific manner? Is it of extrinsic origin—that is to say, is it a virus? Or is it of intrinsic fowl origin—something produced by the tumour cells themselves?

Since now a considerable number of filtrable tumours with widely different histological structure and biological behaviour have been found to occur in the fowl, and since each tumour has its own specific infective agent—or cause—the next question which arises is: How are these causative agents related to each other? Are they all different from each other as the specific nature of their action would seem to imply? Or have they something in common, as one might agree from the fact that they all possess the property of transforming a normal cell into a malignant one? And lastly, there is the question: What is the relation of these fowl tumours to the problem of malignancy in man and in mammals, where filtrable tumours have never been demonstrated?

This is not the first time that these questions have been formulated. They were asked 20 years ago by Rous and his collaborators. They were, however, unable to give an adequate explanation of the relationship of the various filtrable tumours, which they had discovered, to each other, except to postulate for each tumour with a characteristic structure a different specific agent. As regards their relationship to cancer in man and in mammals, they stated bluntly that "the findings of the fowl tumours largely demolish the theoretical basis on which the objections to an extrinsic cause for cancer have been built up." In spite of this statement—or perhaps on account of it—the work of Rous was practically ignored by other students of the cancer problem, and the whole subject was allowed to remain dormant until Gye resumed it. In 1925[2] he published the results of experiments which led him to the conception that the infective agent is not an entity different for each type of neoplasm, but a complex made up of an extrinsic agent—a virus—which may be the same for different types of tumours and which by itself is non-pathogenic—and an accessory chemical factor derived from the malignant cells which i different for different types of tumours and which enables the virus to enter into a normal cell and transform it into a malignant one. Gye then transferred this conception to mammalian tumour and claimed to have demonstrated by his experimental technique the presence of a virus in the malignant tumours of the mouse, of the rat, and of man. A repetition of Gye's work by numerous observers failed to confirm the experimental results on which Gye's conclusion was based, but the activity with which the work on the fowl tumour has since been resumed testifies to the stimulating influence of his work and to the recognition of his contention that the fowl tumours are a true manifestation o malignancy, and that their study may throw ligh on the problem of malignancy in man and in mammals

One method used in Gye's earlier investigation to demonstrate the dual nature of the "infectiv agent"—or "infective complex," as it had bette be called—of the tumour extracts was the inactivatio of the extracts by chloroform, which, acting as a antiseptic, was supposed to kill the virus. Th present work of the authors contains a detaile study of the mode of action of chloroform and certai other antiseptics (phenol and acriflavine) on visib pathogenic organisms such as *B. coli* and the viri of pleuro-pneumonia of cattle. It was found tha a number of hitherto unrecognised factors ma affect the rapidity or completeness with which the pathogenic micro-organisms are killed by antiseptic When a comparison was made with the action these antiseptics on the tumour extracts, the san factors which determined the lethal action on th known pathogenic organisms also affected in like manner the inactivation of the tumour extract It is argued, therefore, from analogy that th inactivation of tumour extracts by antiseptics due to the destruction of a *living* agent. Anoth method of inactivating tumour extracts is by gent heat or by prolonged incubation. A detailed stu of the factors which determine this process lea again by analogy, to the conclusion that inactivati by this process is due to the alteration of a chemic substance. On Gye's reasoning a tumour extract inactivated by an antiseptic should be reactivated by the addition of an extract inactivated by heat. The results obtained in this way are, however, admittedly too irregular to be conclusive. The explanation offered for these irregularities is that the action of antiseptics is not restricted to the living agent, but often leads to changes in other essential constituents of the tumour extract. This line of investigation was therefore abandoned for an entirely new method of analysis of the infective complex by means of immune sera.

For the serological work the authors have employed three different strains of filtrable tumour: the well-known strain Rous No. 1; the Fujinami strain, which is histologically indistinguishable from the Rous No. 1, but which is biologically different in ir as it can be transmitted to a certain breed icks; and thirdly, the Begg endothelioma strain, h has an entirely different histological structure grows more slowly than either of the two other ns. Immune sera were prepared by the repeated tion of extracts of these tumours into ducks, s, and horses. In addition, an immune serum nst normal fowl cells was prepared by repeated tions of fowl embryo into a goat. With these une sera the authors have carried out a variety xperiments which in their variety and ingenuity fascinating to follow. Only a few examples can given here to explain the manner in which the of these sera has enabled the authors to analyse infective complex by allowing these sera to ract with the tumour extract in vitro, and then ing the activity of the mixture by injecting it fresh animals. The normal fowl cell immune m will inactivate the extracts of all the three rent fowl tumour strains. But if the immune m is first treated with normal fowl cells so as bsorb the normal fowl antibody, it has lost its er to inactivate the tumour extracts. Moreover, unabsorbed serum does not inactivate the extracts Fujinami tumour which has grown in a duck. se experiments indicate then that the infective plex of the fowl tumour contains an element fowl origin which is essential for its infective vity.

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[1] The Cause of Cancer. By W. E. Gye, M.D., and W. J. Purdy, M.B., Members of the Scientific Staff of the National Institute for Medical Research, London. London: Cassell and Co 30s.

[2] THE LANCET, 1925, ii., 109.

ow the immune sera prepared by injection of articular fowl tumour inactivate tumour extract that particular strain and also of other strains, they do not lose their neutralising power by vious treatment with normal fowl cells. This is lence of the existence in the infective complex of element which is not of fowl origin. This con-ion is confirmed by numerous experiments of ch perhaps the most convincing one is that an nune serum prepared from the tumours of the inami strain grown in fowls will inactivate tumour racts of that strain, even if the extract is made n a tumour grown in a duck. These experiments given in great detail. and the results are recorded grammatically in such a clear manner that they be understood at a glance. The experimental dence presented in this book is impressive, and kes it difficult to evade the conclusion that the ectivity of a tumour extract is due to an "infective nplex," of which one element is of fowl origin, ile another part is of extrinsic origin, that is to say, a virus. The combined action of both these ments is necessary to produce the malignant nsformation of a normal cell. There is also dence that the virus element is the same in ferent tumour strains, but not in all. Of the ee tumour strains used the Rous No. 1 strain d the Begg endothelioma are held to have the ne virus, while a different virus is postulated from e experimental results for the Fujinami strain. is is an unexpected but important conclusion, cause it indicates that tumours histologically ferent have the same virus, while tumours of nilar histological structure may have a different rus. It is the intrinsic fowl element of the infective mplex which is specific for each tumour strain, d which modifies the action of a virus so that the me virus may infect different types of cells and us give rise to different types of tumours.

In the last chapter the authors attack the question the relationship between these fowl tumours id cancer in mammals and in man. Up to this int their views and arguments are presented with a truly scientific objectivity which does not conceal difficulties in interpretation or gloss over apparent contradictions in the experimental results. But in the last chapter the authors have allowed their vision to run away with their objectivity. The cellular theory of cancer is presented as a malevolent influence which has obscured the true vision of the problem and has retarded progress. It is right to point out that the neglect of Rous's important discovery was a mistake, but that is not the fault of the cellular theory but rather of those who look upon a scientific theory as if it represented the ultimate truth which has to be defended like a religious dogma, and do not understand that it is merely a temporary conception which may require modification in the light of further advances in our knowledge. The cellular theory of cancer is based on the fact that it has not been possible so far to demonstrate in mammalian neoplasms an element separable from the cell which could transmit the disease. This is admitted by the authors in the earlier part of their book. The student of cancer is to-day in very much the same position as the physicist. In both cases observations carried out from different points of view have led to two different conceptions which appear to be mutually contradictory. But the physicist does not appear to be worried by this dilemma. As an eminent physicist has put it, he uses the one conception on Mondays, Wednesdays, and Fridays, and the other conception for the rest of the week. In doing so he hopes to reach eventually a position where he can bridge over the gap. In cancer research we have reached a similar position. In fact, the attractiveness of Gye's theory lies in the fact that it presents a possibility of bridging over the gap between a cellular theory and a virus theory. In Gye's own conception the virus by itself is unable to "cause" cancer even in fowls, it requires in addition the presence of a cellular factor. We know from experimental carcinogenesis, and from occupational cancer in man, that a long period of induction, in which visible cellular changes take place, is necessary before cancer can develop. In fowls, too, we know from the age-incidence of spontaneous filtrable tumours that a similar process must occur there. In fact, it appears to be more difficult to produce in fowls cancer experimentally by tar painting than in mice. Even if we admit for the sake of argument that a virus had been demonstrated in the cells of mammalian tumours, we would still have to consider the cellular changes which enable the virus to enter the cell as being responsible for the disease. The cause of occupational cancer would still be the occupation, the cause of experimental tar cancer would still be the chronic irritation produced by tar painting. Cancer would still have to be considered as a local disease at its inception with operative removal as the proper treatment. There is, in fact, no more resemblance between Gye's conception of cancer as a virus disease and the older germ thories of cancer than there is between the conception of the modern chemist on the transformation of certain elements and the attempts of the alchemists to transform lead into gold. In the last pages of their book the authors seem to be engaged more in fanning the embers of an old controversy than to illuminate the cancer problem by the light of their new conception.

The book is one which every student of cancer should read and consider. That is made easy for him, because it is written in a clear, lucid style which stimulates one to follow the authors in their intricate arguments and experiments.

THE DOMICILIARY SERVICE OF A MATERNITY HOSPITAL.

WITH SPECIAL REFERENCE TO PYREXIA AND THE VALUE OF SKILLED NURSING.

By Gladys B. Carter, B.Sc. (Econ.), S.R.N.,
INSPECTOR OF MIDWIVES FOR MANCHESTER; RECENTLY SUPERVISING SISTER, OUT-PATIENT MIDWIFERY, UNIVERSITY COLLEGE HOSPITAL, LONDON.

The nursing records of the maternity district of University College Hospital during 17 months have been analysed for two purposes: (1) to give the material for a critical evaluation of the service of trained nurse-midwives provided by the hospital for women delivered in their homes by medical students; and (2) to see if a study of all cases of pyrexia in the puerperium occurring during that period would throw any light on its causation.

The records relate to 1327 cases of women delivered on the district by medical students and nursed at home, taken consecutively, beginning on Jan. 31st, 1929, and ending on April 29th, 1931. For the survey of pyrexia the next 82 deliveries and puerperia have been added, making 1409 cases in all, and bringing the record to June 30th, 1931. There is a second group of 255 cases delivered and nursed by pupil-midwives during the same period, February, 1929, to April, 1931, of which records have been kept in the same form, and similarly the next 32 cases have been added for the pyrexia survey, making 287 cases up to July 31st, 1931. These additions were made so as to be able to compare the pyrexia rates month by month for two complete years. Only cases which were fully reported and recorded daily in special uniform case-books have been included, with the result that a few cases delivered by medical students have been omitted, either because the nursing records are incomplete or because the nursing was undertaken by an outside maternity association.

In addition to the 1327 cases, 33 cases were seen on the district and brought into hospital either before, during, or after labour—that is, 2·42 per cent. of 1360 cases. This is not quite a correct picture of the percentage admitted to hospital, for it will be remembered that the students attended a few cases besides the 1327.

Up to April 1st, 1930, the student went to the case alone, and was assisted by a handywoman, who might be a relative or friend, or a woman who looked upon herself as quite as good as a midwife and who had "followed the University" for many years, and might possess considerable skill. This procedure obtained for the first 679 cases in the series. After that date a State-registered nurse-midwife started out with the student to each case, and relegated the handywoman to the background as much as she could or dared. The student is in charge of the case and not the nurse. Including the 82 cases added for the pyrexia survey this period refers to 730 cases. The pupil-midwife is always accompanied by a sister or staff midwife until she has had 20 cases, when she may go alone or with a fellow pupil.

EQUIPMENT.

The *student* takes to his case his bag and a sterile drum put ready in a canvas cover. In the bag two kidney dishes, nail-brush, two pair of Spencer Wells forceps, dressing forceps, scissors, cord ligatures, dressings, and catheter are carried sterile. Material for suturing, and a hypodermic syringe for the local injection of 2 per cent. novocain, are also carried sterile. The drum contains a gown, two towels; a small jaconet sheet, mops, and vulval pads.

The chief alterations in the equipment during the period have been the introduction of gauze masks, consisting of eight layers of gauze, about April 1st, 1929; the provision of two sterilised kidney dishes instead of a small douche can, which was never used, and *the substitution of dry sterile gloves for wet ones.*

The *nurse* who goes to the delivery carries, in a small attaché case kept for the purpose, her own mackintosh apron, dry sterile gloves, gauze mask, nail-brush and soap, also a safety razor and bowl. All patients are shaved. She has no apparatus for treatment of any kind, but is equipped to deal with a normal case if by misadventure the baby came in the absence of the student. This has never happened in practice.

Pupil midwives carry a case bag supplemented by an American cloth carrier and no drum. Sterile gowns were done away with early in the period, as it was found that the pupil wanted to dress up early in the case, and then considered herself to be too sterile to attend to the mother's wants. She now wears a carbolised mackintosh apron and freshly laundered sleeves for the upper-arm, and an unstarched handkerchief cap. Dry sterile gloves have been used throughout. Masks were added at the same time as they were given to the students. Clean white stockings are carried for the mother, and a thin large mackintosh to protect the bed.

The *pupils* carry sterilised kidney dishes, a large douche can, and a rectal saline apparatus. A delivery bundle containing a set of mops, pads, towels, ligatures, &c., sufficient for one case, is baked and put into the case bag. This was introduced about a year ago to replace numerous small bags. A small sterile packet for vaginal examination only is used if the case is not coming on.

The *sister-midwife* has a bag of her own containing her own apron, mask, cap and gloves, labour and uterine stimulants. She manages the case entirely, and only calls for medical assistance according to the C.M.B. rules.

The district equipment is completed by the bag and drum kept in readiness for the *obstetric house surgeon.* The drum contains leggings for the mother and a perineal sheet, in addition to the usual contents of the drum carried by the student. In the bag are the midwifery forceps carried sterile, anæsthetic requirements, and a sterilised apparatus for subcutaneous saline. To this has recently been added an intravenous set with sterile gum acacia solution.

Perchloride of mercury in "soloid" form is carried by nurses and students alike. It is used at a strength of 1 in 1000 for mopping the patient and for soaking the hands. *Pure lysol is carried for emergency* cleansing of domestic utensils only. The district sister now takes charge of the entire equipment. The nurses make the necessary stock, and pack the drums. Students sterilise their own instruments and bowls and keep their own bags in order, asking for clean linings, &c., as required.

Throughout the period development has been in the direction not so much of improvement of the equipment carried but of very much greater care in its maintenance and sterilisation. The provision of masks, sterilised kidney dishes, and dry gloves are important changes, but the outstanding feature is the giving up, on a definite date, of the practice of sending a student alone to a case.

NURSING CARE OF THE MOTHER AND BABY.

Before the period under review every woman booking with the hospital knew that she must provide a woman to be with her at her delivery and to nurse her afterwards. During the puerperium the hospital sent a maternity nurse, not always either general-trained or a midwife, to visit the mother and baby to see that all was well, take the temperature, pulse, and respiration, measure the height of the fundus, and inspect the umbilical cord. It was not always possible to visit every day. The student and the obstetric house surgeons also made routine periodic visits. There was no system of regular and uniform reporting of the nursing care.

The new system aimed at providing a fully-trained nurse with the student at each case, and complete nursing of the mother and baby afterwards, the idywoman becoming a home help and doing no atment of any kind. The nurses did not begin go out with the students—except in isolated cases, erally for a complicated delivery requiring the sence of the doctor—until April, 1930. General-ined nurse-midwives were substituted for the ternity nurses from January, 1929, and the 1327 es dealt with were attended by this type of nurse ly. In every case one daily visit at least is paid, cept if Sunday falls on a day after the fifth day of e puerperium, when a visit may be omitted if e case is normal. If there is any illness of mother baby, and always in stitch cases, the nurse does e entire nursing, and in any case of a raised morning mperature or any unsatisfactory condition—e.g., itches in the mother or prematurity in the baby—limited evening visits are paid. Geographically, e district, which is large, falls into three areas, d a proposal was made to give a complete nursing rvice in one area. This was rejected, as it was felt at the available staff should provide skilled nursing here it was most required.

It is not easy to eliminate the handywoman, and in ractice it is found that if a mother engages a satisactory woman who expects to attend to the mother nd bath the baby she is apparently better off—rovided that a skilled nurse goes daily to inspect nd take over if need arise—than the mother who ratefully accepts the full service of the nurse, but whose feeding, house, and children are neglected because there is no competent person to look after them in the absence of the nurse.

The study of the puerperal pyrexia returns tends to show that nursing by the handywoman is an added risk.

From the first a record of the handywoman in attendance at every case has been kept, so that it is accurately known what handywomen have been associated with cases of pyrexia. When a woman books she is asked what provision she has made for her lying-in. She is informed that a nurse will be in attendance at the delivery with the doctor, and is offered the services of the nurse in the puerperium twice a day for the first three days, and once a day for the remaining seven days. If she prefers a handywoman, the result for her will be that the nurse will call and inspect every day, but not in the evenings unless need arises.

There are practically no unbooked cases in the series. Table I. shows the extent of ante-natal care.

TABLE I.—*Extent of Ante-natal Care.*

—	Students' district.		Midwives' district.	
	Cases.	Percentage of total.	Cases.	Percentage of total.
No record of ante-natal examination	13	0·97	—	—
Booking only (in many of these blood for Wassermann test was taken)	71	5·35	11	4·31
One complete examination, obstetric and medical	203	15 22	29	11·37
Variable number of subsequent examinations	1040	78·37	215	84·31

The 84 cases of which there is no record or no complete examination occur, with very few exceptions, in the first six months, as a careful system of follow-up by letter and visiting was built up during that period.

Whether the daily nursing is done by the nurse only or by the handywoman under the supervision of the nurse, the visits are reported in exactly the same way. The nurse carries a printed notebook into which she enters the particulars at the house, and she personally gives her report to the supervising sister or her deputy, who enters it into the ledger with the nurse's name. After her first visit she reports the hour of birth and nature of the delivery, the number of rooms and occupants, state of the house, name and address of the handywoman, her cleanliness or otherwise, and any illness in the house—e.g., impetigo.

The hospital possesses a fund which allows for the giving of ten free dinners to the lying-in mother, also milk. The nurses are expected to find out if the woman is getting sufficient food, and if they consider that the case is one in which a good midday meal is not forthcoming they bring back additional particulars as to the number in family, husband's earnings, and rent. We consider this is a most important factor in the successful recovery of the mother and the establishment of lactation.

Each nurse has her own bag, used for daily visiting only. If she is completely nursing the case she leaves nail-brush, mackintosh apron—Woolworth's 6*d.* aprons are largely used—and, if necessary, bowls at the house, and they are brought back at the end of the puerperium. For inspection visits she carries a nail-brush, apron, and bowls for use as required. Perchloride of mercury, 1 in 1000, is used for mopping and for disinfecting of hands. No equipment, such as thermometer or scissors, may be carried outside the bag.

Stitches are swabbed with normal saline as routine, and every primipara is "jugged" with saline for the first two or three days until œdema and abrasions have disappeared. Bad lacerations are irrigated with a rubber catheter, a boiled-up douche can being left covered up at the house. Any tendency to slough is treated by a change to eusol half strength, and recently by chloramine T, 1 per cent. Cleaning up with hydrogen peroxide is very rarely necessary. Lotio rubra has been used very successfully to small areas not granulating well. No stitch dressings are applied. Liquid paraffin is charted for stitch cases and administered on the same day as delivery. No other aperient is given, and, if required, the bowels are opened about the third day by a simple enema with rectal tube. Normal cases are given two pills "78" (colocynth with ipecacuanha) about the evening of the second day and, if aperients are required during the puerperium, freshly-made senna tea is given. Rubber gloves are carried for use if there is any suspicion of infection about mother or baby, and doubtful cases are attended to in gloves.

The daily particulars are reported under the following heads:—

Mother.—Breasts and nipples; lochia; perineum; fundus; stools; urine; temperature, pulse, and respiration; tongue; sleep; diet; general condition; and treatment.

Baby.—Cradle or mother's bed; clothes, good or bad; umbilicus; diet; stools; urine; vomiting; weight; temperature; skin; eyes; mouth; general condition; and treatment.

Two-minute thermometers were originally used, but recently half-minute ones have been substituted. The nurse puts the thermometer in the mouth while she makes her preparations or looks at the baby, so that it has been in the mouth at least three to five minutes before the temperature is charted. In studying the pyrexia rates it must be remembered that the morning temperature is taken roughly between the hours of 9 A.M. and 12 midday, and the evening temperature between 5.30 P.M. and 6.30 P.M. The baby's temperature is not taken as a routine, except for premature babies, when a rectal thermometer registering down to 85° F. is used, and the reading is looked upon as a check upon the adequacy of feeding and care. The height of the fundus is measured with a ruler.

The nursing care on the pupil midwives' district is exactly similar, and reports are taken in the same way. The pupil does everything for the mother and baby, and for the last year every case has been visited for 14 days. The mother gets up on the tenth day if well, the nurse visiting to bath the baby, and if the mother is a primipara she baths it herself under supervision. The results from the extension of the puerperium are good, lactation is better established in 14 days, and the loss of milk on getting up, which so often occurs because the mother has to grapple with all her household cares unaided, is guarded against. The baby's weight on the fourteenth day is a much better criterion of success or failure or need for modification of the feeding than the tenth day weight. The district sister visits each case several times in the puerperium, and makes a thorough inspection of mother and baby before the case is left.

TABLE II.—*Summary of Cases.*

—	Cases delivered by students	Percentage.	Cases delivered by pupil midwives.	Percentage.
Number of cases ..	1327	—	255	—
Primiparæ	186	14	28	10·98
Multiparæ	1141	86	—	89·02
Normal labour and born before arrival	1250 { 970* 280†	94 { 73 21·4	243 { 215* 28 †	95 { 84·3 10·98
Abnormal cases delivered and nursed at home	73	5·72	12	4·72
Forceps rate ..	22	1·65	4	1·56
Stillbirths	27	2·03	4	1·56
Neonatal deaths ..	11	0·82	3	1·17
Torn perineum, excluding forceps and born before arrival	110	8·28	21	8·23
Discharging eyes: treated with 5 per cent. protargol ..	52	3·91	10	3·92
No treatment ..	35	2·64	9	3·53
(Only one case of ophthalmia in the series was serious; it was transferred to St. Margaret's Hospital (L.C.C.), where recovery soon took place.)				
Sore nipples ..	150	11·3	30	11·7
Cracked nipples ..	22	1·65	15	5·88

*N.L. †B.B.A.

Soreness and cracking of nipple occurs generally between the second and fifth days, and is trivial. It is treated with glycerin and boric acid or tinct. benzoin co. Only one case of breast abscess occurred on the students' district and one case of raised temperature, due to inflammation of the breast, which subsided, on the pupils' district. In neither case was there cracking or soreness of the nipples. No routine puerperal treatment of breasts or nipples is carried out. Overfull breasts are treated by support and, rarely, by hot bathing and manual relief. A breast pump is never used. Careful instruction of the mother is relied upon to prevent engorgement. A nipple shield is used if the nipples are poor, but is discarded as soon as possible.

Failure to breast-feed is very rare. In cases o slow establishment of lactation, large babies, or weakl and premature ones, complementary and extra feed of lactose solution 1/8 are given in the first few day Extra milk feeds are never given until late in the puerperium, when it becomes evident that the breas milk is really insufficient. Attendance on the bab is not given up until it is doing well or has bee transferred to the infant welfare clinic. The averag number of visits per patient is 11·18 on the students district and 16·44 on the pupils' district.

SURVEY OF CASES OF PYREXIA.

Records of pyrexia have been kept under thre headings:—

(1) Cases which are notifiable under the Puerperal Pyrex Order, the words "with recurrence within that period being taken to mean a second appearance of 100·4° F. a time *over* 24 hours later than the first appearance in the cases where it has not remained up in the 24-hour peri

(2) Cases which reach 100° F. at any one time duri the puerperium, but do not become notifiable.

(3) Cases which do not reach 100° F., but are 99° F. *over in the morning. The class is a little* indefinite, b includes those cases which run a slightly febrile puerperiu with or without symptoms. It is included so as to see its occurrence has any relationship to the other grou (See Table III.)

TABLE III.—*Pyrexia-rates Before and After Advent Nurses.*

	Students.		Midwives.	
February, 1929, to March, 1930.	Before advent of nurses. 679 cases.		Before advent district siste 118 cases	
	Cases.	Percentage	Cases.	Percenta
(1) Notifiable pyrexia ..	35	5·22	5	4 23
(2) 100°F.	32	4·71	8	6·77
(3) Under 100°F. ..	54	7·95	11	9 33
Torn perineum, 677 cases	72	10·63	19	16 01
April, 1930, to June, 1931.	After advent of nurses. 730 cases.		After advent dis rict siste 169 cases.	
	Cases.	Percentage.	Cases.	Percenta
(1) Notifiable pyrexia ..	16	2·19	2	1·18
(2) 100° F.	33	4·52	7	4·14
(3) Under 100° F. ..	11	1·5	7	4·14
Torn perineum, 648 cases	40	6·17	2 (on 137 cases).	1·4

A second grouping gives the severity of the pyrexi (*a*) Cases over 102° F.; (*b*) cases 101°–102° (*c*) cases 100°–101° F.; (*d*) cases with temperat of one day only. (See Table IV.)

There are no maternal deaths to consider, eit on the district or on cases brought in during puerperium. All cases are set out monthly to if there is any seasonal variation, but the period too short to draw any conclusions. The follow factors are also considered in their relation pyrexia: (1) Ante-natal care; (2) overcrowding a dirt; (3) character of the labour; (4) the attenda at the labour and during the puerperium.

The figures have been divided up to show incidence of pyrexia before and after the cha in April, 1930, when a general trained nurse-midw began to attend every case delivered by a stude the pupils' district a highly experienced district r began to take out the pupils on Feb. 1st, 1930, ing a similar notable change. Probably before happened—certainly on the students' district— wearing of masks was quite useless, because an asked handywoman was allowed to pore over ipment and patient. The same division has been le of the figures for torn perineums, as they also d to show the effect of more skilled assistance. Tables III. and IV.)

BLE IV.—*Pyrexia-rates Before and After Advent of Nurses (Another Classification).*

February, 1929, to March, 1930.	Before advent of nurses. 679 cases.		Before advent of district sister. 118 cases.	
	Cases.	Percentage.	Cases.	Percentage.
Cases over 102° F. ..	23	3 38	2	1·69
101°–102° F. ..	15	2·2	4	3·38
100°–101° F. ..	17	2·51	7	5 93
With temperature of one day only	14	2·06	—	—

April, 1930, to June, 1931.	After advent of nurses. 730 cases.		After advent of district sister. 169 cases.	
	Cases.	Percentage.	Cases.	Percentage.
Cases over 102° F. ..	12	1 63	1	0·59
101°–102° F. ..	8	1 09	—	—
100°–101° F. ..	15	2·04	4	2·36
With temperature of one day only	15	2·04	5	2·95

A study of Tables III. and IV. shows a drop in the ates of notifiable pyrexia on both districts, and, to certain extent, of all types, but the drop is much more marked in the very mild cases. The greatest drop is also shown to occur in the rates above 102° F. and in the group 101°–102° F. (Table IV.). The one-day group and the 100°–101° F. do not show very much change. It seems to be fair to infer that pyrexia of one day's duration and up to 100° F. is due to fairly constant causes, such as reaction, activity of the breasts, delayed action of the bowels, &c., while the higher rates and the lower rates of longer duration are due to illness of some kind. Cases which run a continued temperature of the 99°–99·8° F. variety always cause anxiety, and sometimes become morbid later on. Full investigation of some of these would probably show uterine infection. From the point of view of nursing precautions they are always treated as possibly infectious. The higher incidence of the lower rates on the midwives' district is possibly due to the larger number of routine evening visits paid.

TABLE V.—*Analysis of Cases of Notifiable Pyrexia.*

—	Students' district. 51 cases.		Midwives' district. 7 cases.	
	1929–1930 Feb.–March. Before nurses.	1930–1931 April–June. After nurses.	1929–1930 Feb.–Jan. Before sister.	1930–1931 Feb.–June. After sister.
(1)	12	5	—	—
(2)	4	1	4	2
(3)	11	2	—	—
(4)	8	8	1	—

(1) Cases brought into hospital, investigated, and uterine sepsis found.
(2) Evidence of uterine sepsis but no investigation made.
(3) Not diagnosed, probably sepsis.
(4) Diagnosed as not septic.

No attempt has been made to classify the non-notifiable pyrexias, but the notifiable cases are divided into four groups, as shown in Table V.

The non-septic cases were assigned to: pyelitis, 5; asthma, 1; small-pox, 1; bronchitis, 2; influenza, 2; pleurisy, 1; rheumatic fever, 1; acute tonsillitis, 1; chest condition, 1; reaction, 1.

Antenatal care.—One case of notifiable pyrexia had had no antenatal care. She had a thrombus. Three cases of the up-to-100° F. type also had had none. On the midwives' district an unmarried primipara was taken as an emergency and ran a mild but notifiable temperature, probably due to sepsis, and one non-notifiable case had been booked only.

Overcrowding.—The housing conditions of the cases were as follows:—

One family to a room ..	345 cases	..	25·99 per cent.
(20·28 per cent. of these were primiparæ.)			
One family to two rooms ..	712 cases	..	53·65 ,,
(11·93 per cent. of these were primiparæ.)			
One family to three rooms ..	167 cases	..	12·5 ,,
,, ,, four ,, ..	58 ,,	..	4·37 ,,
(5·2 per cent. of all cases were living in basements.)			

Six families had seven persons, excluding the new baby, in one room only; 11 families had ten persons in two rooms. In one case there were 12 persons and the baby to two rooms. Of the 17 cases of definite sepsis only one was noted as living under extremely bad conditions.

In this case there were seven persons housed in one filthy basement room. The labour was normal, pyrexia developed on the sixth day, and, on investigation in hospital, uterine sepsis was found, due to a hæmolytic streptococcus. The baby never did well. When the woman again became pregnant she was refused treatment at home, but given a bed in hospital. Labour and the puerperium were normal, and the baby did well.

Many labours were conducted in unsuitable surroundings. Although the mother may not develop sepsis, the baby undoubtedly suffers from spending its first ten days in an overcrowded bed.

On the midwives' district for the present year all cases have been visited antenatally by the sister and pupil, and a careful inquiry made into the suitability of the home and adequacy of the preparations. In many cases great efforts have been made by the mother to clean up the home. Really unsuitable cases have been referred to this hospital or to the municipal hospital.

CHARACTER OF LABOUR IN CASES OF PYREXIA.

In the 51 cases of notifiable pyrexia on the students' district the character of the labour was as follows:—

Normal: 42 (9 primiparæ); B.B.A., 3. Total 45 (88·2 per cent.). *Abnormal:* forceps, 3; twins, 2; abortion, 1. Total 6. Torn perineum in four cases.

The 17 cases of definite sepsis investigated occurred as follows:—

Normal: 13 (3 primiparæ); B.B.A., 1. *Abnormal:* forceps, 2; twins, 1. Total 3. Torn perineum in three cases in multiparæ (forceps, 1; normal labour, 2).

Of these investigated cases only two had had a nurse both at delivery and giving full care in the puerperium. One was a forceps delivery who was found to have a *mild* streptococcal infection of the uterus, and the other a primipara with twins who had a non-hæmolytic streptococcal infection, the temperature not exceeding 101·6° F. Four of the septic cases were nursed by the same handywoman, who also had four non-notifiable pyrexias. No other handywoman had more than two cases, and none near enough together to cause suspicion.

In the seven cases of notifiable pyrexia on the midwives' district there were five cases of normal labour (two primiparæ) and one B.B.A. (Total 6, or 85·7 per cent.) There was one case of twins and one of torn perineum.

THE PROBLEM OF THE CARRIER.

Whenever a case of pyrexia is brought into hospital and the pyrexia is shown to be due to sepsis, every effort is made to track down the cause; the throats of students, obstetric assistants, nurses, and handywomen and husbands are searched for offending organisms, and bags and equipment are disinfected with the utmost care. The suspicion remains that at times a germ is carried, even when entirely different people have handled the cases. One small group of cases is instructive in this connexion.

A multipara was delivered normally on Dec. 1st and developed pyrexia on the 4th; the temperature reached 102·4° F. There were no uterine signs, and the case was not brought in, as it cleared up in a few days and the cause of the pyrexia was, therefore, undiagnosed. A primipara was delivered on Dec. 4th and had a normal puerperium until Dec. 14th, when she became ill; the temperature rose to 104·6° F., and she developed a severe sore-throat. She was admitted and investigated, and found to have a severe hæmolytic streptococcal infection of the throat, but the uterus and vagina were sterile. On Dec. 4th a multipara was delivered normally, and on Dec. 14th her temperature rose to 103·4° F. on the third day and she was admitted. She had a rash and sore-throat; hæmolytic streptococci were found in numbers in the uterus and vagina, and a few in the throat. The pathologist then sent for the first woman and took an intra-uterine swab, finding hæmolytic streptococci. Different students had delivered these women, and different nurses and handywomen had visited them.

No conclusions are drawn, but from the point of view of the person who is responsible for the nursing of cases an undiagnosed pyrexia, especially one with few uterine signs, is a very grave anxiety.

SUMMARY AND CONCLUSIONS.

The maternity district of this hospital was reorganised in 1928 to provide general-trained nurse-midwives to go out with students to deliveries and nurse the mother afterwards. It seems possible to draw the following conclusions from the results so far obtainable:—

1. A skilled nursing service for women delivered in their homes by medical students is of educational value because it teaches how good nursing care during labour, especially prolonged labour, diminishes physical and mental wear and tear in the mother, and during the puerperium helps to restore her to full health and to give the baby a good start in life.

2. The factors which lead to a diminution of the accidents of labour and puerperal sepsis in domiciliary practice are: (*a*) Choice of suitable cases in the antenatal department; (*b*) the displacement of the handywoman; (*c*) the provision and maintenance of adequate equipment, including sterilised dressings, gloves, and masks.

3. Cases of pyrexia not obviously due to non-uterine causes should be brought into hospital and investigated: (*a*) for research, (*b*) to prevent the spread of infection.

I wish to express my gratitude to Prof. F. J. Browne, director of the obstetric unit at this hospital, for allowing me to keep these records and for access to the records of cases brought into hospital, and for many suggestions about this paper.

IRELAND.

(FROM OUR OWN CORRESPONDENT.)

THE PROBLEM OF THE SLUMS.

So unexpectedly fruitful have the sweepstak on behalf of hospitals proved that it is hardly surprising that the same method is put forward fo solving other problems. The problem of the Dubl slums is one of long standing, and is no less pressin than it was 20 years ago, notwithstanding th extensive housing schemes that have been carri into effect both by the Dublin corporation and by th Government. At the present time of financi stringency it seems impossible for either of the authorities to undertake any outlay on a large scal at any rate for some years to come. In view of thi some of those who are anxious about the slum proble are casting looks at public sweepstakes as a means raising the requisite funds. A fortnight ago in t Senate of the Irish Free State, a resolution w carried, almost without opposition, asking that t executive council should promote legislation make part of the surplus from sweepstakes promoted under the Public Charitable Hospitals A available for the clearing of insanitary areas a the housing of the working classes. Dr. Gogart who seconded the resolution, suggested that the should be a ten years' extension of the hospit sweepstakes for the purpose of closing up the slu in the country. Sir Edward Coey Bigger, an expe enced sanitary administrator, admitted that knew of no better means of getting the money th through the sweepstakes; and Senator Johnson, w has hitherto opposed the legislation of sweepstak thought that as the country had departed from straight path, it might as well use the money deri from the sweepstakes to prevent disease as to c it. The decision of the Senate has elicited a vigor protest in a leading article in the *Irish Times.* T writer points out that if, as has been done, the ra are to be relieved by the proceeds of sweepstak and housing for the working classes to be provi from the same source, there appears to be no log reason why other public expenditure should not similarly met. The taxes, as well as the ra might be lessened, and the country might fin reach the happy position of being completely paras on the gambling spirit of the world.

UNITED STATES OF AMERICA.

(FROM AN OCCASIONAL CORRESPONDENT.)

THE HEALTH OF CHILDREN.

Two new publications[1] give important data conc ing the health and sickness of the nation's child and of the use of methods to preserve their he in different parts of the country. The first gives s of the results of the survey made by the med section of the White House conference, results wh it may be remembered, were incomplete when conference met last year. They are not even complete and a further publication is promised h the use of preventive measures by nativity, k, and race, as well as some other analytical erial derived from the survey, will be presented. s doubtless safe to say that no such national ey of child health has ever been made in the in any country, and the administrative methods ented in detail in this publication should prove seful record for those undertaking similar work the future.

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[1] Health Protection for the Pre-school Child: a nati survey of the use of preventive medical and dental service children under 6. By G. T. Palmer, Dr. P.H., M. Derryb and P. van Ingen [illegible] e White H Conference. Londo [illegible] 1931. Pp. The Health of the [illegible] ickness, phy defects, and morta [illegible] nior statisti U.S. P.H.S. (Public [illegible] Washingt Government Printin [illegible] Pp. 159. 35 cents.

he scope of the surveys analysed by the senior istician of the public health service has been ch more limited, and the question may be asked ether these samples from selected districts represent e random sampling of the 24,000,000 who are imated to be in attendance at educational institu- ns of the United States, or of the 38,000,000 who ong in the same age-groups (5–20). However, in introductory chapter, Dr. Taliaferro Clark says believes that the findings "fairly represent the tent and character of the illness and physical fects that are commonly found in school groups."

Most "health examinations"—i.e., medical aminations—of apparently healthy children, are ven in the first year of life. Those who do not get ch examinations as infants rarely get them before ing to school. Altogether, half the city children six years old have had a health examination, while ly about a third of the rural runabouts have had e same advantage. Customs vary widely from 2 per cent. examined in Berkeley (California) to 1 per cent. in Roanoke (Virginia). Only 11 per cent. f city pre-school children have "dental health xaminations," economic considerations determining ery largely which shall be in the lucky minority. hen the children get to school over three-quarters f them are found to have one or more decayed teeth, hile nearly as many have "one or more defects ther than defective teeth, vision, or hearing." The percentage with decayed teeth gradually decreases during the school years until at college age as many as 40 per cent. are found without any decay at all. Seriously defective vision, on the other hand, becomes gradually more common as age advances. Minor defects of vision decrease, which accords with the observation that the anatomical development of the human eye is not complete until 18 to 20 years of age. The largest proportion of pre-school children immunised against diphtheria is found in Niagara Falls, New York, where half the youngsters are protected. The average for city children under six years is only 14 per cent.—a figure which demonstrates forcibly how much remains to be accomplished in this direction.

In connexion with a study of school absences due to sickness, it is interesting to note that only 18 per cent. of these illnesses received medical attention. One cannot help wondering how such a proportion might be changed under a system of family health insurance. It is true that according to the statistics all cases of pneumonia and diphtheria were attended by a doctor. But are not the statistics perhaps misleading here? These are medical terms requiring medical diagnosis. How many cases of diphtheria, unattended by a physician, may there have been that were reported as "sore-throat"? And only one-fifth of the cases of "tonsillitis and sore-throat" had been visited by a doctor. Colds are, of course, the greatest wasters of school time, being more than twice as important as any other cause, while whooping cough is the disease which keeps its individual victims longest out of school (average, 26 days) followed by scarlet fever (22), pneumonia (21), diphtheria (17), scabies (14·5), and measles (12). Of the total absence from school 57 per cent. is due to sickness and 43 per cent. to "other causes." The proportion of lost time due to sickness is distinctly higher for the younger than for the older children.

STEREOFLUOROSCOPY.

The perfection of a stereofluoroscope for use in hospitals is reported from the California Institute of Technology. The instrument consists of two X ray tubes connected to a single transformer. A fifty-cycle current causes alternate emissions of rays from these two tubes which are spaced at approximately the same distance as the interval between the eyes. The rapidly alternating shadows on the screen are made to give a three-dimensional picture by a device by which each eye shall perceive the shadow thrown by one tube, but not that thrown by the other. The device is a rotating shutter driven by a motor at such a speed that it is synchronised with the alternations in the electric current supplied to the X ray tubes. The instrument is adjustable so that the solid image in front of the screen can be made on exact scale reproduction of the body. Callipers can be introduced into the image to measure the apparent interval between any two parts of the shadow in any plane. The employment of this instrument has been aided by a grant from the Rockefeller Foundation.

AUSTRALIA.

(FROM OUR OWN CORRESPONDENT.)

ROCKEFELLER FOUNDATION BUILDING AT SYDNEY.

THE scheme inaugurated in 1928 for a rearrangement of the medical teaching at the University of Sydney has nearly reached completion. It was made possible by two donations—one of £250,000 by Mr. Bosch, to establish Chairs in medicine, surgery, and bacteriology, now held by Profs. Lambie, Dew, and Wright; and the other a gift of £100,000 for the erection of a building to house the new laboratory departments. The plans have now been finished and tenders have been called for the erection of the building. The former medical school will house the departments of anatomy, physiology, and pharmacology. The clinical and allied departments—medicine, surgery, pathology, bacteriology, gynæcology and obstetrics—will be transferred to the new building, which is in close proximity to the Royal Prince Alfred Hospital. Museums and libraries will be included and there will be ample accommodation for individual research workers in the various departments.

STATE LOTTERIES IN NEW SOUTH WALES AND QUEENSLAND.

There is much speculation about the benefits which the New South Wales Hospitals are deriving from the recently instituted State lottery. The State government has not made any figures available about the profits of the lotteries or their destination. It would appear that no additional assistance has been granted to the hospitals, but that the Government has been able to maintain its subsidies, which amount to about £450,000 a year. This may have been difficult without the assistance of the lottery. It is understood, further, that it is the Government's intention to maintain and supplement the general working expenses of the hospitals in the usual way, by subsidy, and then, when additional funds have accumulated, to reduce the large overdrafts which have been built up by some of them. The lotteries are being very rapidly subscribed, two or even three being drawn in a week. At the present rate it has been estimated that the revenue from this source will be nearly £600,000 per annum. The opinion of the hospital secretaries is divided on the question whether the lottery is interfering with voluntary subscriptions. The general opinion appears to be that *if there had been no lottery, there might have been* no subsidy.

The figures are available from the Queensland State lottery known as the Golden Casket; over 300 have been drawn. The first six were conducted under the auspices of the Queensland Patriotic Committee and the proceeds were devoted to movements for the benefit of returned soldiers. The Government took over in March, 1920. The details of the lotteries held under Government control until the end of the last financial year, Nos. 7–298, have been published and it seems that the gross receipts totalled £7,905,467. Of this, £364,881 went to State income-tax; £191,718 to Federal income-tax; postage was £181,804; and working expenses £453,546. Prize money amounted to £4,412,056, 64 per cent. of the gross receipts, and the profit for distribution to hospitals was £2,312,460, which represents about 30 per cent. of the total.

BERLIN.

(FROM OUR OWN CORRESPONDENT.)

ARTIFICIAL ABORTION IN COUNTRY PRACTICE.

SHORTLY before his death a few months ago Dr. Alfred Grotjahn, professor of social hygiene at Berlin University, reported a curious incident. He received anonymously the case-book of a doctor who formerly practised in a country town of 25,000 inhabitants, and had kept full notes of all the curettages he had performed. The book was accompanied by a letter asking Prof. Grotjahn to report on the facts described in these notes in the interest of the campaign for the legalisation of artificial abortion. This he did, and it appears from the register that in the one year, 1927, the uterus was emptied not less than 426 times, while the operation was refused in 127 other cases. No woman was operated on whose pregnancy exceeded three and a half months. The majority of them were married; indeed, only 74 were unmarried. In 55 women the operation was performed twice, and in five three times in the same year. Abortion was induced in the doctor's own consulting-room and without anæsthesia, except in a few cases where an anæsthetic was administered by his wife. The operation was done not only when pregnancy was definitely ascertained but also for prophylactic purposes when it was assumed. Cases where it was indicated by disease of the mother were comparatively few. In some cases, however, the father or mother had tuberculosis; in one a mother had given birth to three deaf-mute children, in another to feeble-minded infants. The clientèle included women of every social class, from wealthy proprietors and landowners to minor employees and workmen. Among the unmarried there were seven young women in easy circumstances who lived with their parents and had failed in their use of the contraceptives previously recommended to them.

The register shows clearly how popular artificial abortion has become not only in large cities but also in an ordinary country town. It is regarded as harmless, and has been so in the hands of a m who was obviously an efficient practitioner a according to his notebook, had no death or injury among his patients. He was a co advocate of the legalisation of artificial abor but Prof. Grotjahn saw many objections. Wi who would like to have children, he said, would *compelled by their husbands to have the op* engaged couples would have sexual intercourse more commonly than they now do, and engageme would lead not to marriage but to a prolonged liais He believed, however, that the present law reform, and proposed State assistance for paren with numerous children.

APPLE DIET FOR DIARRHŒA.

Prof. Reyhe says he has had good results wit the treatment of acute gastro-intestinal disorders wit apples.[1] He has tried it on patients suffering from acute gastritis, vomiting, and profuse diarrhœa sometimes with high fever; adults as well as infants The patients must abstain for 12–24 hours from drinking, and during that time eat nothing besid mashed apples. They may eat as many as the like up to 20 a day, in amounts of 100 to 250 g. a each meal. Vomiting and tenesmus soon disappea after a few diarrhœal motions fever decreases, an on the second day the fæces usually become soli In severe chronic diarrhœa—e.g., in tuberculosis sprue—a favourable effect was observed, but it wa only transitory. Reyhe thinks that the tannic aci in the apples is the cause of the benefit, togeth with the reduction of food and especially of flui The method is very simple, and more agreeable the patient than the usual cure by starvation, cast oil, and gruel. After the acute stage a mixed di can be given, but without milk or vegetables for son days.

PHYSICAL AND MENTAL DISABILITY IN GERMANY.

According to a statistical record prepared Dr. Prinzing, of Ulm, the well-known medic statistician, 33,192 blind people have been report in Germany, being 53 per 10,000 of the populatio Besides the totally blind this number includes th who, even with the aid of spectacles, are unable find their way in the street or to see a finger at distance of 1 metre. Of these, 2307 are war victi In 18,911 cases the cause of blindness could ascertained: in 9 per cent. the condition was c genital, in 4·6 per cent. gonococcal infection responsible, and in 15 per cent. glaucoma. Eighty- persons, all foreigners, were blind as a result of sm pox. The number of deaf-mutes was 31,670, being 6 10,000 for men and 5·1 per 10,000 for women. half the cases the condition was said to be congenit when it was acquired it was usually a sequel to sca fever, measles, cerebro-spinal fever, or other infecti Of the deaf-mutes under 20 years of age 88 per ce of those between 20 and 40 years, 82 per cent., those above 40, 44 per cent. were brought up special institutions. A total of 276,467 people w registered as completely infirm, of whom 190, were men, including 82,278 war victims, and 85, women. The causes were congenital defects, infan paralysis, rickets, sequels to diphtheria and tub culosis, injuries, gout and rheumatism, apople and other nervous diseases. The number of sligh infirm was 116,974 men, including 45,007 war victi and 27,190 women. A total of 207,514 were re l as mentally infirm, of whom 6090 were war ıms.

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[1] See THE LANCET, 1930, i., 526 and 672.

FOREIGN BODIES IN THE BRONCHI.

r. Wessely, writing in the *Archiv fur Klinische ırgie,* describes three interesting cases of foreign es in the bronchi. One was that of a child l 6 years who had inspired a foreign body from a . When impacted it did not produce any ptoms, but when it became loose it caused severe h and its knocking against the vocal cords was ible from some distance. It was removed three ks later by bronchoscopy. The second case was of a child of 10 years; after an operation for -diphtheritic atresia of the larynx a broken ıula was found by radioscopy in the left lower of the lung. After the removal of the cannula operation the infiltration of the lung ceased, and child, who had shown rachitic symptoms, became ıst and developed normally. In the third case apprentice, aged 18, suffered for 18 months from ere attacks of cough, whose cause could not be ertained by internal or laryngeal or radiographic mination. A small shadow was eventually ected on the plate, and under local anæsthesia a wing-pin was removed through the bronchoscope. every case of uncertain troubles of the lung radiophy should be performed to see whether they are to a foreign body.

SOCIAL INSURANCE IN GERMANY.

)f the 64 millions of Germans in 1930, 22 millions ·4 per cent.) were insured against sickness, and his number 16·5 million dependants must be added, o enjoy free treatment. The number of insured inst sickness is thus 60 per cent. of the total ulation. 23·7 millions (35 per cent.) are insured inst accidents, and about the same number against age and invalidity. The insurance against employment includes 16·5 millions (25·8 per cent.). the current year the number of those insured against kness has considerably decreased—probably by nillions—as a result of unemployment.

BUDAPEST.

(FROM OUR OWN CORRESPONDENT.)

FREE CHOICE OF DOCTOR.

THE conflict between the social insurance and edical men in Hungary has reached a new stage th the resolution of the board of directors of the ıtional Medical Association to the effect that the anagement of the Association finally intends to opt the repeated resolutions of its representatives favour of the free choice medical system. ccording to this resolution the old system has to be opped in all sickness insurance institutions and by ın. 1st, 1933, the free choice system must be in tion. The Association was forced into this policy ot only by the pressure of the medical profession, ut also by the attitude of the Social Democratic arty, which in the interest of the public sharply emanded free choice of doctor. The present panel octors are naturally against it, arguing that the resent critical economic conditions make it very ndesirable to disturb them in the well-deserved ositions which ensure them their meagre bread. he management of the Association has appointed a ommittee to study how the panel doctors may be ıdemnified, but even if they do not find a satisfactory solution, they will still have to yield to the interest of the medical profession as a whole.

SEMMELWEIS POSTAGE STAMPS.

At the suggestion of Dr. Tiborius Györi, teacher of medical history in the University of Budapest, the general post office has resolved to issue postage stamps bearing the portrait and name of Semmelweis. The intention of this action is partly to emphasise therewith Semmelweis's Hungarian nationality, which owing to his German-sounding name and to his having published his works in German, is not generally known, and partly to follow foreign example in making popular the names of those who deserve immortality.

NOTES FROM INDIA.

(FROM OUR OWN CORRESPONDENT.)

" ECONOMY."

AT the moment retrenchment dominates the mind of everybody, from the top to the bottom, in the various medical departments in India. All of us are engaged in justifying our own posts or in trying to retain as many of our assistants as possible. Most of us are willing to accept any cuts in general expenses, to the extent of almost complete paralysis of our present activities, provided we can keep our trained personnel over the bad years—which we hope will be few. The 10 per cent. cut in our salaries seemed at first to be a disaster, but now we are beginning to feel that nine-tenths of our pay is better than no pay at all.

The research department has, as usual, been the first to feel the axe; two-thirds of the grant of the Indian Research Fund has been cut. The point of view of the non-expert retrenchment committee is obvious: " Medical research is a more or less new idea. Certain medical problems have been solved, much misery has no doubt been obviated, lives may have been spared, which presumably means that money has been saved; but this saving is all rather problematical, especially in times when trade is bad and there is no shortage of labour. In any case there is no harm in giving medical research a holiday for a year or two; so we will give them enough money to carry on the skeleton organisation and the rest must go." What they do not see is that continuity of work is the most important point, and that our handicap in India has not been lack of urgent medical problems, or even of money; it has been the lack of trained personnel. During the last 12 years a useful staff (85 per cent. Indian) has been trained. The cut in the income of the fund will mean the dismissal of part of this staff, and the setting-back of the clock, as far as medical research in India is concerned, for a number of years, even if the grant is again raised to the pre-retrenchment level within a year or two.

The most preposterous suggestion—though one which I am glad to say is unlikely to be accepted by the Government of India—is that the posts of director-general of the Indian Medical Service and of public health commissioner should be abolished. No doubt the proposed abolition of the post of director-general will be hailed with delight by the left wing of the profession in India as a fatal blow to the domination of the Indian Medical Service in India. But no man has shown himself more interested in the aspirations of the independent medical profession in India than General Megaw, and, if there is to be any extensive reconstruction of medical organisations, no one could be better trusted to give impartial advice to the Government of India on this subject. If recruitment for the Indian Medical Service is discontinued—and there are indications that the policy adopted in this country may include such a step—it might be advisable to change his title, but it is in the interests of every member of the medical profession, and indirectly of the population at large, that the Service should have strong representation at the centre.

Bengal has been spared the attentions of a local retrenchment committee, but this does not mean that the strictest economies have not had to be practised. In some instances these economies have necessitated the discontinuance of the use of comparatively expensive specific drugs for which there are no substitutes—a deplorable state of affairs. On the other hand, in Madras, where the necessity for economy is less, we find a very active retrenchment committee cutting the rations and allowances of nurses at an end of the scale and suggesting the abolition of the post of director of public health and his department at the other. One despairs of the intelligence of a body of men who, in the year 1931, can solemnly ask, "what good does the public health department do to anybody ?"

THE INSTITUTE OF HYGIENE.

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Notifications.—The following cases of infect disease were notified during the week :—Small- 44 (last week 48) ; scarlet fever, 1498 (last week 17 diphtheria, 993 ; enteric fever, 29 ; pneumo 1358 ; puerperal fever, 27 ; puerperal pyrexia, cerebro-spinal fever, 26 ; acute poliomyelitis, encephalitis lethargica, 10 ; dysentery, 13 ; thalmia neonatorum, 87. No case of cholera, pla or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals o London County Council on Dec. 22nd–23rd was as foll Small-pox, 80 under treatment, none under observation (last week 107 and .2 respectively) ; scarlet fever, 1439 ; diphtheria, 1484 ; enteric fever, 9 ; measles, 517 ; whooping-cough, 423 ; puerperal fever, 21 (plus 12 babies) ; encephalitis lethargica, 222 ; poliomyelitis, 3 ; "other diseases," 217. At St. Margaret's Hospital there were 23 babies (plus 8 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there were no deaths from small-pox or enteric fever, 44 (10) from measles, 6 (1) from scarlet fever, 37 (6) from whooping-cough, 24 (3) from diphtheria, 44 (13) from diarrhœa and enteritis under two years, and 132 (27) from influenza. The figures in parentheses are those for London itself.

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The number of stillbirths notified during the week was 244 (corresponding to a rate of 42 per 1000 births), including 38 in London.

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[1] See THE LANCET, 1931, i., 611.

PUBLIC HEALTH SERVICES

PUBLIC HEALTH IN THE LOCAL ACTS OF 1931.

HE annual appearance of the Index to the al and Private Acts[1] is a reminder of the arkable local modification of the general utory standard in matters of public health local government. The 112 Local Acts of session (Oct. 28th, 1930, to Oct. 7th, 1931) apy nearly 5000 pages. The Brighton Corporation alone is 400 pages long, but, as it is a consolidating , it is not all fresh law. The large proportion of mon-form clauses in these Local Acts makes it per to repeat again the Select Committee's recomndations that all powers granted to local authorities he last five sessions should now be collected into ew adoptive Public Health Act. This step would ainly save the local councils much time and money. anwhile, to enable medical officers and others to e the latest developments, we set out our annual nmary with special reference to clauses which pear to be novel. We have often commented on legislative innovations of progressively adminised municipalities. A good instance occurs in the r Taunton Act, which locally extends from seven nine years the age-limit under Part I. of the Children t (Infant Life Protection).

INFECTIOUS DISEASES PROVISIONS.

Variations of public health law, noted in previous ars, need no elaborate mention. Familiar clauses out infectious diseases include the power to close nday schools and to exclude children from public ertainments, the municipal supply of antidotes d remedies to medical practitioners with or without arge, measures against milk-borne infection, the wer for a medical officer to enter premises where ere is dangerous infectious disease, and to get ormation from house-occupiers as to ordinary ectious disease cases on their premises, and the ual powers for cleansing and destroying filthy icles. What seems a new power is one in the unton Act, for compulsory disinfection or destrucn (subject to compensation for damage due to gligence) of books, bedding, and clothes used by tients suffering from tuberculosis with discharges. rious groups of infectious diseases provisions apply Gillingham, Tamworth, and Brighton, to measles, rman measles, whooping-cough, chicken-pox, scabies, gworm, and influenza; West Hartlepool adds umps to this list, Romford and Dagenham substitute umps for influenza.

FOOD, BATHS, AND WATER-SUPPLY.

Food-poisoning is notifiable in several areas. e usual ice-cream and potted meat clauses are equent. Suitable larder accommodation has long een a common requirement, backed by the power inspecting food storage. A new power appears the Portsmouth Act (Section 32 (1) (vii)) of ohibiting the placing of gas-meters in pantries, rders, or cupboards where food for human use is ept. Brighton's power to provide municipal cold orage is an interesting enterprise. Portsmouth and outhampton have obtained authority to erect and anage, and to charge fees for the use of, medicated nd other baths, "including baths, the efficient roperties of which are due to agencies other than water." Part IV. of the Surrey County Council Act (Establishments for Massage and Special Treatment) arranges for proper control of places where "radiant heat, light, electric, vapour, or other baths for therapeutic treatment," are available. Reference to this provision was lately made in THE LANCET (1931, ii., 653) in connexion with a London prosecution. There is a saving for medical practitioners' establishments, and for public hospitals and infirmaries, recognised voluntary hospitals, and registered nursing homes. As regards water-supply, we may note the following outstanding features: the power to place water tanks under streets (in the Preston, Doncaster, and Ashton-under-Lyne Acts), the requirements at West Hartlepool as to pumping from, and care of, rainwater tanks and wells in or under houses, the reduced charge for metered supply to approved voluntary hospitals at Brighton, and the compulsory notification at Taunton of the use of a hose-pipe.

PROTECTION OF AMENITIES.

Town-planning and the protection of amenities may nowadays be reckoned close akin to public health. Surrey have created several precedents in 1931. The county has taken powers for acquiring land by agreement either for the purpose of saving a fine view or for controlling the country alongside a river bank or a new road. Section 67 of the Surrey Act, preventing ribbon development along new by-pass roads, is timely. No local authority has any outstanding new power in respect of river pollution or sewerage. Surrey has another new clause to stop the dumping of refuse within the county without consent not only of the county council but also of the local authority in whose area the dump exists. At Tamworth no unauthorised person is to sort over or disturb the contents of dustbins or of refuse tips; the penalty is a fine up to £5. The restriction of advertisements and of offensive trades, the care of trees, and the control of petroleum filling-stations—a point in which some localities are going beyond Section 11 of the Petroleum (Consolidation) Act of 1928—are further efforts to preserve amenities. Nuisance by the ejection of steam or water-gas to the annoyance of the public will be held in check under new powers at Gillingham, Brighton, and Taunton. The often intolerable nuisance of noise is also combated. The Taunton Clause (Section 165), making noise a nuisance within the Public Health Act, may be cited as a precedent. The noise must be "capable of being prevented or mitigated, having due regard to all the circumstances of the case"; and at least three householders must complain. There is a saving for railways exercising statutory powers. Control of noise in the form of crying of newspapers is familiar; control of noise in sales in the market (at Taunton) is new. Several towns insist on silencers for stationary internal combustion engines, and Brighton has a special clause to check noisy speed-boats.

MOVABLE DWELLINGS, CAMPERS AND CAMPING GROUNDS.

In the interests of health and good order, as well as of social and natural amenities, the Surrey Act has some striking novel provisions as to movable dwellings and camping grounds. Local legislation as to dwellers in tents and vans has been increasing in intensity in the past few years in England.

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[1] H.M. Stationery Office. 1931. 2s.

in India than General Megaw, and, if there is to be any extensive reconstruction of medical organisations, no one could be better trusted to give impartial advice to the Government of India on this subject. If recruitment for the Indian Medical Service is discontinued—and there are indications that the policy adopted in this country may include such a step—it might be advisable to change his title, but it is in the interests of every member of the medical profession, and indirectly of the population at large, that the Service should have strong representation at the centre.

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iously a place for municipal clinics. The distrust which the midwives formerly viewed the clinics almost entirely disappeared. The maternal th-rate associated with childbirth from 1928 ards was 8·79, 8·33, and 8·57 in Glasgow, to be pared with 6·98, 6·87, and 6·95 in Scotland.

lthough defaulting is much in evidence at the ereal diseases clinics an improvement is noticeable ecially among men. The new cases of congenital hilis dropped from 351 in 1929 to 250 in 1930. umber equal to 14 per cent. of the new cases of te syphilis had less than one month's treatment 27 per cent. had less than three months' treat- nt, and it was estimated that 16 per cent. of the es of acute gonorrhœa were infectious on defaulting n treatment.

bout half of the 4191 new houses were three- med houses of the "intermediate" type. This e has proved the most serviceable for the relief vercrowding under a controlled system of letting. ring the last two years 248 houses have been cated to tuberculous families. Dr. Macgregor ers to the growth of new suburbs within and hout the city, to slum clearance schemes involving 4 houses, to the rehousing of 894 tenants from gerous buildings, and expresses his confidence t the general housing situation is being very sibly relieved by combined municipal and private erprise. The schoolmasters in the eastern area tify to the improvement in every respect ong the rehoused children.

City of Aberdeen.

Dr. H. J. Rae opens his report with an account of ecial investigations carried out at the city laboratory. J. Smith describes the investigation of 221 cases puerperal fever and 25 cases of septic abortion curring in Aberdeen during the last eight years, and inquiry into the source of infection in 18 cases of erperal fever and three cases of septic abortion. Smith shows that hæmolytic streptococci played e predominant part, and that in 21 cases the eptococcus was demonstrated in the throat and se swabs of those in attendance at the confinement. a result, adequate masking is advocated as an dispensable precaution in midwifery practice. pies of Dr. Smith's work have been circulated nongst the practitioners in the city and neigh- uring counties, and suitable outfits are on view r practitioners interested.

During the first six months of the Scottish inquiry to the incidence of tuberculous infection in milk, 5 samples have been examined at the city hospital. 161 samples of raw ungraded milk 8·7 per cent. ere positive; of 46 samples of milk as retailed per cent. were positive; and of 138 samples of steurised milk (excluding Grade A pasteurised) 1 per cent. were positive.

The transfer of the poor-law hospitals to the berdeen Town Council took place in 1927, and as e result of the Local Government Act the coördina- on of the medical services has been completed on regional basis. The medical officer of health of e city is also chief medical officer of the counties Aberdeen and Kincardine. The university rofessors of medicine, surgery, and midwifery have een appointed consultants at the hospitals transferred the municipality, and the hospital and specialist edical services of the city are available for the whole egion, though for the first few years Kincardine- hire comes in as a customer rather than a partner. he arrangement for the common medical services the city and the two counties has proved very atisfactory.

Since 1919 the corporation have built 2714 houses nder housing schemes. Of these, 154 have four ooms with a rental of £32 10*s.*; 1656 have three ooms with a rental ranging from £22 to £28, with a heaper type at £16; whilst 904 have two rooms ith rentals mostly from £13 to £14. It is estimated hat 2500 families are living in sublet houses. No houses were closed in 1930 because alternate accommodation could not be provided.

County of Aberdeen.

Dr. Rae says that it was not possible to continue the immunisation schemes against diphtheria and scarlet fever during 1930. Results as regards scarlet fever have been so unconvincing that this branch of the work will not be continued, but active immunisation of susceptible children against diphtheria will be carried out in populous areas. Dental treatment of school-children is gaining popularity so fast that the staff of dentists will have to be increased. No official arrangements have yet been made for the operative treatment of tonsils and adenoids.

The notifications of non-pulmonary tuberculosis are increasing, probably because of the excellent facilities for treatment provided at Woodend Hospital. In addition to Woodend, the county council have a call on 27 of the 62 beds at the Culter Convalescent Home, which are used as a preventorium for "pretuberculous" children. The county tuberculosis scheme has adequate sanatorium and hospital accommodation, and a waiting-list is practically unknown.

The county has taken full advantage of the provisions of the Housing (Rural Workers) Act, 1926, and since the Act came into operation up to June 30th, 1931, the number of houses reconstructed has totalled 928. Dr. Rae describes this Housing Act as the only one which has assisted in conserving housing in rural areas, and in preventing rural depopulation. Most of the eight districts have realised its importance, but only one of the ten burghs (Huntly) made use of this Act in 1930.

The county council pay 30*s.* per week for patients admitted to the maternity hospital. During 1930, 101 patients were treated in the maternity hospital and 48 in the antenatal annexe at a cost to the county of £133. The nursing services, though fairly comprehensive, are not complete. There are 38 associations and most of them employ Queen's nurses. A grant is paid for the services of these nurses as part-time health visitors, and Dr. Rae would like them to have a training in health visiting before they undertake the work. A number of them are provided with small cars.

The veterinary inspector reports a severe outbreak of cow-pox affecting 90 per cent. of the cows on a large dairy farm. The milkers were also attacked, several being unable to work for some time. One cow suffering from cow-pox was infected on the udder with virulent diphtheria bacilli.

Paisley.

Dr. G. V. T. McMichael shows how necessary it is to provide hospital treatment for pneumonia. During 1930, 80 per cent. of the total notified cases occurred in houses of one and two rooms, which constitute nearly two-thirds of the total houses in the burgh. For the same housing reason, an increase of maternity beds is needed. There were 199 notifications of scarlet fever with six deaths, the highest case fatality for ten years. Diphtheria notifications numbered 111 with a case fatality of 7·2 per cent. Of 40 notifications of ophthalmia neonatorum 20 were proved to be due to the gonococcus. There was no impairment of vision and there has only been one case of blindness from this cause since 1918.

The number of mothers attending the antenatal clinic was 47 more than the previous highest, and in December a postnatal clinic was opened in charge of Dr. Mary Stevenson. The cases of rickets at the child welfare clinics have shown a welcome decrease during the last three years.

The three-year programme includes 400 houses to replace those to be demolished or closed, 510 to abate overcrowding, and 240 to meet the growth of the population. In order to rehouse tenants of uninhabitable houses, 500 two- and three-apartment houses are being built to be let at rentals of 6*s.* 3*d.* and 7*s.* 3*d.* per week, inclusive of rates.

Surrey now gives a lead as to campers and camping. In Surrey "movable dwelling" will include a cart, carriage, truck, tramcar, motor-car, caravan, trailer, or other vehicle used or intended to be used for human habitation, temporary or otherwise. On complaint of the local authority, a court of summary jurisdiction may prohibit movable dwellings in any area to protect local amenities or to save residents or visitors annoyance from noisy, indecent, or other offensive conduct. The local authority may itself provide (and temporarily close) camping grounds, and may make by-laws as to any camping grounds in its district in the interests of proper control, cleanliness, amenities, orderly conduct, or the prevention of annoyance. We may expect such provisions as these to be imitated and elaborated elsewhere in future.

THE VARIETY OF COLLECTIVE ACTIVITIES.

Aerodromes at Doncaster and Taunton, bands and concerts in many cities, education, gas, electricity, and water-supply, libraries and museums, parks and swimming-pools, motor omnibus and tram services, small details like the power to install mechanical washers in wash-houses at Southampton—these features give us a varied picture of local activity. The activity has its own risks. Several localities have taken powers to create a general insurance fund; Gillingham has set up an Education Accident Fund. The fact that this is not a valueless precaution was shown a few weeks ago when a verdict of £1000 damages was awarded to a youth attending a London County Council school for injuries due to the alleged negligence of a teacher.

ANNUAL REPORTS OF MEDICAL OFFICERS OF HEALTH.

THE following are 1930 statistics of Glasgow, the city and county of Aberdeen and Paisley.

Name of district and estimated 1930 population.	Birth-rate.	Death-rates per 1000 of the population.					Death-rates per 1000 births.		
		All causes.	Tuberculosis.	Cancer.	Respiratory diseases with influenza.	Heart disease.	Infant and neonatal mortality.	Young child (1–5 yr.) mortality.	Maternal mortality in childbirth.
Glasgow .. (1,088,810)	21·4	14·2	1·14	1·32	2·5	2·0	101/34	49	8·6
Aberdeen City (159,006)	20·8	13·1	0·75	1·52	1·7	—	80/31	24	6·1
Aberdeen Co. Extra-burghal (109,826)	20·4	12·1	0·69	1·46	1·3	—	70 } 25*	—	4·8
Burghal.. .. (38,504)	21·7	13·8	0·83	1·53	1·6	—	100		
Paisley .. .. (87,036)	20·5	14·6	1·13	1·54	2·4	2·1	107/50	52	5·6

* Death-rate during first 10 days of life. Stillbirths per 100 live births:—Glasgow 4·4, Aberdeen City, 4·9, Aberdeen County 0·7, Paisley 4·8.

Glasgow.

Dr. A. S. M. Macgregor says the outstanding event of the year was on May 15th, when the Local Government Act came into operation, as the result of which the health department has now four main branches—namely, the general public health services; the combined education and child welfare services; the transferred general hospitals and the outdoor medical poor-law services; and the mental services. The transference took place with great ease and smoothness. The original and transferred hospital ' number 6200. The reorganisation of the hospi facilities is under consideration, and its aim is as much elasticity as possible and the adoption of high standards. The distinction between the infectious and the non-infectious sick need not be too rigidly maintained, says Dr. Macgregor. Much excell hospital provision is devoted to the aged and infirm and the chronic sick, who could be accommodated in institutions other than up-to-date hospitals. Further, the improved outdoor medical service with a domiciliary nursing scheme, will tend to sav hospital accommodation. The unification of th services for school-children with the maternity an child welfare work will lead to the general use of join clinics. The systematic attention given to mino ailments is bearing [illegible] nt services the principal [illegible] m dation for acute cases. The number of persons institutions tends to increase, not because there a real increase in mental disorders, but owing to t increasing longevity and the lessening death-rate mental hospitals. Some additional accommodati has been provided in the mental hospitals, and t beds for observation to which mental patients can *admitted without immediate resort to* certificat have been increased by 60 to a total of 250.

Among infectious diseases pneumonia stood prominently during 1930. In the first quarter th was a measles epidemic and during the last quar a high incidence of pneumonia associated with f during December. During this month 129 hours fog in a fortnight were recorded, and on Dec. 2 522 pneumonia beds were occupied in the fe hospitals, exclusive of a large number in the transfer general hospitals. Mild scarlet fever was wid prevalent in the autumn, and the policy of ho treatment was pressed as far as the provisions of Public Health Act permitted. Enteric infecti were mostly of the mild paratyphoid B form efforts to trace the source of infection did not m with success. The death-rate from phthisis was lowest on record; during the last twenty y the death-rate from non-pulmonary tuberculosis fallen more rapidly than that for tuberculosis of lung. The opening of Mearnskirk Hospital (466 b has enabled large numbers of children to be trea under specialist care and by open-air methods.

Much space is devoted to the consideration maternal mortality. Dr. John Walker finds puerperal pyrexia embraces a large number of ailm but connotes sepsis in approximately half the c reported. Advantage was taken of hospital treatm for 93 per cent. of the "fevers" and for 70 per c of the "pyrexias." There is a lower case-fat because more cases are being reported. Dr. Marg Thomas contributes an article on the epidemiol bacteriology, and treatment of puerperal se This study deals with 800 patients treated in Belvedere Hospital, of which 600 were under own treatment between May, 1929, and Janu 1931. About one-quarter of the cases follo abortion or miscarriage. There was a slightly gre tendency to fatal infection in instrumental c Dr. Thomas admits the advantages of gly treatment, but did not find it possible to ado for more than half of the 800 cases, and thinks it be ruled out when the local infection has sprea the adnexa, pelvic cellular tissue, and periton and also when the infection has invaded the b stream. As regards general methods of treatm she concludes that quinine and arsenic and merc preparations and vitamin A are valueless, and in default of an efficient specific serum for the str coccus of puerperal sepsis, the use of a scarla antiserum is the only rational method at pr available. Drs. MacCunn and Wylie describe technique employed at the antenatal clinics and that the primary attendances have increased 1052 in 1923 to 2992 in 1929. Less than half confinements are attended by doctors, so that the yed by the diuresis which is produced as a result treatment. It is well known that some degree of sis plays an important part in many cases of onic pyelitis and cystitis. Prostatic hypertrophy men and pregnancy in women are outstanding mples of lesions which initiate chronic infection the urine, and in many cases of chronic cystitis re is some degree of atony of the bladder. In te pyelitis or cystitis, where the commoner anti- tics are usually contra-indicated, it is an established nical fact that the combination of bland diluent inks with alkaline diuretics results in a flushing t of the urinary tract and amelioration of mptoms together with a lessened degree of infection. vestigation of the action of drugs like benzoates d salicylates, which have been regarded by some useful urinary antiseptics, shows that along with régime of abundant fluids they have a distinct line diuretic action. The same holds good with id phosphate of sodium and with the citrate or etate of potash. It is a moot point therefore hether the efficacy of such reputed antiseptics benzoates and salicylates does not depend in part on the establishment of a free flow of urine. It is worthy of note that hexamine, given in the usual quantity of grs. 40–50 daily in divided doses, is never found in the urine in a concentration sufficient to yield a formaldehyde content stronger than 1 in 5000, which ordinarily will only suffice to inhibit the growth of the common infecting micro-organisms, but will not exert any decided bactericidal action. The available evidence does not justify the assumption that benzoates or salicylates have a definite antiseptic action upon the urine. It does suggest, however, that the known clinical results following the combination of hexamine with ammonium benzoate or phosphate depend upon: (1) the diuresis produced affording mechanical cleansing; (2) the formation of acid urine, unfavourable to bacterial growth and liberating formaldehyde; and (3) the inhibitory effect of the free formaldehyde upon the causal micro-organisms.

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1. Stockman, R.: Edin. Med. Jour., 1927, xxxiv., 396.
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CORRESPONDENCE

HE OUT-PATIENT PROBLEM: A SUGGESTED POLICY.

To the Editor of THE LANCET.

SIR,—The want of correspondence between the rge numbers of sick people who go to the out-patient epartments of hospitals and the inadequate means treating them efficiently can be met in one of three ays. First we might increase the staff and organise ttendances so that the accommodation available not overcrowded at any one time. One objection this method in the case of large towns, where he hospitals are usually central and the suburbs re spreading, is that patients have to travel considerable distances. In many hospitals, even with areful organisation, accommodation is insufficient nd there is not space for new buildings. It would e better policy to attract the bulk of patients elsehere by offering them facilities for treatment earer their homes. The out-patient department ould then be of more real use as a centre of conultation or a place for specialised forms of treatment.

Secondly, there is much to be said for the establishment of public clinics. Consider how of late years the reatment of common complaints is being solved or particular sections of the community. School linics have been set up to deal with minor defects nd diseases. These clinics differ from the majority f doctors' surgeries in that the buildings are more uitable for their purpose, there are trained nurses to apply treatment, and a clerical staff to make ppointments, keep records, and deal with correspondence. Adults who have as children experienced these benefits may suggest their extension, and municipal clinics are already being set up for certain classes of adults—e.g., for the antenatal examination of mothers; for patients with rheumatism, tuberculosis, &c.

There is a third method which, in theory at least, would preserve the incentive to effort on the part of individuals—doctors and patients. The majority of people are of independent spirit and willing to pay for their treatment, but the money they have to pay with is limited. If there were a reasonable certainty that they would be quickly cured by treatment they would pay, but if the chance is only small, they are unwilling to risk their money, and tend to put off treatment as long as they can. At length the burden of ill-health may become such that their earning power is lessened and they have then no money to spend. All disease is a social misfortune; and the time to treat it economically is in its beginnings. It is important to get people quite well after injuries, acute illnesses, or in the early stages of diseases which begin insidiously, such as those due to exposure to cold and wet, in order to prevent changes taking place in muscles or joints, or in other organs at a later date.

The writer would like to see the practitioners in a district form themselves into groups each with a house specially built or converted to their use. These medical houses would have consulting-rooms and be equipped not only with means for physical treatment, such as light, heat, baths, massage, but also with a laboratory for routine pathological investigations, and an X ray plant for diagnosis. Practitioners who confined themselves to special branches such as eye work would have their hours there as well as general practitioners. A nursing staff would be engaged to assist, especially in physical treatment, and a clerical staff to keep the books and make appointments. Private surgeries would be superseded by consulting rooms at the common medical house. All classes of patient—poor, insured, and private—would be seen there but not necessarily at the same hours.

The coöperation of groups of practitioners that is here suggested is coöperation in establishing the medical house, equipping it, managing it, and sharing the expense. It does not imply division of responsibility for the treatment of an individual patient. The doctor who is consulted by the patient would be responsible for him to the same extent as he is at present. The effect of setting up such medical houses would be to raise the standard of practice, to make it possible to treat patients more efficiently, and to prevent maladies developing at a distant date—e.g., arthritis as a late result of traumatism or toxic conditions.

A REVIEW OF THE PHARMACOLOGY OF URINARY ANTISEPTICS.

BY JOHN M. JOHNSTON, M.B., F.R.C.S.,
POLLOK LECTURER IN MATERIA MEDICA AND THERAPEUTICS IN THE UNIVERSITY OF GLASGOW.

THE term "urinary antiseptic" is commonly applied to a drug given internally to exert an antiseptic effect on the urine and which itself is excreted by the kidney. It therefore excludes substances which would be held by the renal cells (the hypothetical renal antiseptics) and medicaments injected per urethram, or applied locally by the surgeon. Infection of the urinary passages is common, usually easy to recognise, but often difficult to cure, and so far there is no available drug which can be termed a certain urinary antiseptic yielding constant therapeutic results. A study of the literature shows that the reputation of most urinary antiseptics is founded upon a rather empirical use or upon unsound scientific principles. In reviewing the problems connected with their therapeutic application, certain points must be borne in mind. On the pathological side it is to be remembered that infection may spread to the urinary tract by the blood stream, by the lymphatics, and by direct spread, generally associated with stasis of flow, along the urinary passages themselves. In the initial stages of acute inflammatory infection, the usual urinary antiseptics are contraindicated. In chronic lesions the infecting micro-organisms may be found deep in the epithelial or subepithelial tissues, beyond the reach of antiseptic urine, and in many cases a local immunity is established with little or no subjective symptoms to direct attention to the condition.[1] Moreover, it is useless to expect cleansing of the urinary tract until any source of infection is located and eradicated.

Certain specific organisms such as *B. tuberculosis* and the gonococcus are resistant to many urinary antiseptics. *B. coli* and the pyogenic cocci (usually of mild virulence) are most commonly met with in the chronic lesions under discussion. The coliform group grows freely in acid urine and the cocci more readily in alkaline urine. In infected urine, urea is decomposed with the formation of ammonium carbonate which will eventually render an acid urine alkaline. Once an alkaline medium is obtained, cocci and ammonia-producing micro-organisms multiply rapidly.

THE IDEAL URINARY ANTISEPTIC.

The ideal urinary antiseptic should be rapidly absorbed and excreted, and should have no irritant action on the gastro-intestinal tract, the liver, or the kidney. When taken by the mouth, such a drug may be modified chemically at any part of its course. It meets the selective cellular elements of stomach, bowel, liver, and kidney, and the powerful chemical influences of the blood with its delicate acid-base mechanism. From the renal epithelium it passes highly diluted to the bladder reservoir, the only site where normally the urine remains for any length of time. The antiseptic properties of drugs employed depend upon the form in which they appear and act in the urinary channels. Of the commoner urinary antiseptics, boric acid (as borates), hexamine, and some aniline dyes are excreted unchanged. There is a large group of substances which, although their original chemical composition would indicate potent antiseptic action, are excreted in altered form.
Being potentially toxic irritants they are rendere
inert either by the blood, or (mainly) by the kidney
For instance, the essential oils, including turpenti
when used in safe doses, are excreted as harmles
products, although in such cases as copaiba a portio
may pass unchanged with some resulting antisept
action. Another group includes drugs which a
synthesised or "conjugated" to form non-irritati
and pharmacologically inert bodies. Salicylates an
benzoates are combined with glycocoll to for
salicylurates and hippurates respectively. It h
been shown, however, that the synthetic powers of t
kidney can be overtaxed by sufficient dosage aft
two or three days, when salicylates and benzoat
appear unchanged or unconjugated in the urin
Such unconjugated benzoates exercise a slight inhi
tory action on the growth of *B. coli*, but benzoa
and salicylates are of no demonstrable value
themselves as direct urinary antiseptics. Hex
resorcinol (Caprokol) has a fate similar to that
benzoates, being excreted in conjugated form (
site of detoxication is not yet definitely ascertaine
but some portion appears unchanged and is said
render the urine bactericidal.[3] Clinical experie
over a varied series of cases does not appear to sh
it to be of any exceptional value as compared w
other remedies.

It has been generally recognised that the quest
of urinary antisepsis is closely connected with
reaction of the urine. Rendering the urine
prevents the growth of urea-splitting mi
organisms and tends to be unfavourable to co
The suggestion, however, that urine may be mad
acid as to inhibit the growth of bacteria, such as *B.*
is untenable, as it has been shown that it is imposs
therapeutically to obtain a hydrogen-ion concentra
(pH) of the urine outside the limits of acid norma
although it is comparatively easy to acidify alka
urine.[2] Titratable acidity, estimated in terms
decinormal alkali, is unreliable owing to the d
fluctuation of urinary output in a given case and to
complex buffer action of the urinary salts.
acidity of urine depends mainly upon the degre
preponderance of mono-sodium hydrogen-phosp
(acid) over di-sodium hydrogen-phosphate (alkal
Acid phosphate of sodium, given in doses shor
producing diarrhœa (saline cathartic action) does
increase the true acidity beyond the normal li
owing to salt-buffer action, although it may inc
the titratable acidity in irregular fashion. Ammon
benzoate[2] and ammonium phosphate[4 5] are effi
urinary acidifiers tending to establish the pH
level of 5·5 to 6·0 (7·0 being neutral point).
ammonium radical is converted into urea, and
whole of the acid ion is available for union
the alkaline ions of the blood plasma, thus low
the blood alkalinity, with consequent excretion
proportionate amount of acid sodium phosphat
the kidney to maintain the alkaline equilibrium o
plasma. The corresponding sodium salts do
increase the acid phosphate excretion, as after ab
tion the sodium ions add to the alkaline ions o
blood. Apart from consideration of the reactio
the urine regarded as a culture medium, there is
the important fact that hexamine, one of the
urinary antiseptics, only becomes effective by
gradual liberation of formaldehyde in an acid u

THE PART PLAYED BY DIURESIS.

One aspect of the problem of urinary antise
seems to have escaped due attention—viz., the

ed by the diuresis which is produced as a result reatment. It is well known that some degree of is plays an important part in many cases of onic pyelitis and cystitis. Prostatic hypertrophy men and pregnancy in women are outstanding mples of lesions which initiate chronic infection the urine, and in many cases of chronic cystitis re is some degree of atony of the bladder. In te pyelitis or cystitis, where the commoner antitics are usually contra-indicated, it is an established ical fact that the combination of bland diluent aks with alkaline diuretics results in a flushing of the urinary tract and amelioration of aptoms together with a lessened degree of infection. estigation of the action of drugs like benzoates l salicylates, which have been regarded by some useful urinary antiseptics, shows that along with régime of abundant fluids they have a distinct ine diuretic action. The same holds good with d phosphate of sodium and with the citrate or tate of potash. It is a moot point therefore ether the efficacy of such reputed antiseptics benzoates and salicylates does not depend in part on the establishment of a free flow of urine. It is worthy of note that hexamine, given in the usual quantity of grs. 40–50 daily in divided doses, is never found in the urine in a concentration sufficient to yield a formaldehyde content stronger than 1 in 5000, which ordinarily will only suffice to inhibit the growth of the common infecting micro-organisms, but will not exert any decided bactericidal action. The available evidence does not justify the assumption that benzoates or salicylates have a definite antiseptic action upon the urine. It does suggest, however, that the known clinical results following the combination of hexamine with ammonium benzoate or phosphate depend upon: (1) the diuresis produced affording mechanical cleansing; (2) the formation of acid urine, unfavourable to bacterial growth and liberating formaldehyde; and (3) the inhibitory effect of the free formaldehyde upon the causal micro-organisms.

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Secondly, there is much to be said for the establishent of public clinics. Consider how of late years the eatment of common complaints is being solved r particular sections of the community. School linics have been set up to deal with minor defects nd diseases. These clinics differ from the majority f doctors' surgeries in that the buildings are more uitable for their purpose, there are trained nurses o apply treatment, and a clerical staff to make ppointments, keep records, and deal with correpondence. Adults who have as children experienced hese benefits may suggest their extension, and nunicipal clinics are already being set up for certain lasses of adults—e.g., for the antenatal examination f mothers; for patients with rheumatism, tuberulosis, &c.

There is a third method which, in theory at least, would preserve the incentive to effort on the part f individuals—doctors and patients. The majority f people are of independent spirit and willing to pay for their treatment, but the money they have to pay with is limited. If there were a reasonable certainty that they would be quickly cured by treatment they would pay, but if the chance is only small, they are unwilling to risk their money, and tend to put off treatment as long as they can. At length the burden of ill-health may become such that their earning power is lessened and they have then no money to spend. All disease is a social misfortune; and the time to treat it economically is in its beginnings. It is important to get people quite well after injuries, acute illnesses, or in the early stages of diseases which begin insidiously, such as those due to exposure to cold and wet, in order to prevent changes taking place in muscles or joints, or in other organs at a later date.

The writer would like to see the practitioners in a district form themselves into groups each with a house specially built or converted to their use. These medical houses would have consulting-rooms and be equipped not only with means for physical treatment, such as light, heat, baths, massage, but also with a laboratory for routine pathological investigations, and an X ray plant for diagnosis. Practitioners who confined themselves to special branches such as eye work would have their hours there as well as general practitioners. A nursing staff would be engaged to assist, especially in physical treatment, and a clerical staff to keep the books and make appointments. Private surgeries would be superseded by consulting rooms at the common medical house. All classes of patient—poor, insured, and private—would be seen there but not necessarily at the same hours.

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It is not possible for each of us acting alone to be well equipped to supply modern efficient treatment for many of the common maladies, but it is possible by combination to be much better equipped than we are. That the problem is too large to be solved by individual effort alone, is plain from the fact that each practitioner at present is limited in the amount of diagnostic effort he can make and the physical treatment he can give. These would be extended and increased by combination in providing means and facilities. The group could put up the expense where the individual could not. Looked at from the patient's point of view, the expense in treatment could be made tolerable for the individual by the application and extension of existing insurance schemes. Hospital out-patient departments would then become what they should be, places for consultation and for special treatment.

I am, Sir, yours faithfully,

A. R. FRIEL, M.D., F.R.C.S.I.

Devonshire-place, W., Dec. 14th, 1931.

THE OWNERSHIP OF RADIOGRAMS.

To the Editor of THE LANCET.

SIR,—Could any of your readers clear up some points which may be of interest to our profession generally? I, as a patient's private medical adviser, think fit to advise that radiograms shall be taken. The patient agrees, and the radiograms are taken. A report is given to me in consultation with the radiologist, and also contained in a private letter to me in confirmation. So far the matter is clear, I think. Next, I pass the patient on, as a voluntary case, to a mental hospital; a colleague—a local consultant—agrees with my action and advises the patient's relatives accordingly. The patient's next action is to go into the hospital—where our diagnosis is apparently in process of being confirmed—meanwhile the patient is undoubtedly not capable of making a decision where thought is concerned.

The patient's relatives now ask me for the films of the radiograms (there were three), stating that they are their property, as they paid the fee of the radiologist, which is true. But for what did they pay? For the photographs, as in the case of an ordinary portrait? For the doctor's opinion on the films? For both, thus including a trade and a professional matter under one heading?

The actual films have been passed on to the medical superintendent of the mental hospital, and are with the patient's other papers in the proper file. There seems to be some doubt in the minds of those I have consulted as to whose actual property the films are. There may be several claimants: 1. the radiologist, who has sent them to me to support his report. 2. The patient, alternatively her relatives, since they paid the fee in connexion with the radiograms. 3. Patient's medical adviser, as being part of the report addressed in confidence to him. 4. The temporary property of the medical person at a given time in charge of the case; if so, this does not determine the final property owner.

In the case of an ordinary portrait, I understand that the plate belongs to whoever pays for it, and that the reproduction of pictures cannot be undertaken without the authority of that person, actual or implied. In the case of the radiogram, other factors seem to be involved.

I am, Sir, yours faithfully,

H. GEORGE P. CASTELLAIN, M.D. Cantab.

Birmingham, Dec. 22nd, 1931.

SANOCRYSIN IN PULMONARY TUBERCULOSIS.

To the Editor of THE LANCET.

SIR,—I was interested to read the papers by Dr. Allon Pask and Dr. Knud Secher and your leading article in THE LANCET of Dec. 19th. Despite the facts that sanocrysin can only be an adjuvant to general treatment, that its sphere of usefulness is limited, that the drug sometimes appears to be ineffective, and that its immediately beneficial effects, when these occur, may not be maintained, I believe its introduction is the most important advance in the treatment of phthisis since the recognition of the value of collapse treatment. Its greatest usefulness perhaps is that it has certainly widened the scope of the applicability of collapse methods. Adverse criticism of sanocrysin is probably based on insufficiently extensive trials, faulty dosage, and unfortunate selection of cases.

My experience of the treatment, dating from a visit to Denmark in 1924 at a time when the original clinical experiments were being carried out, supports the contentions advanced by Dr. Pask both as regards the usefulness of sanocrysin and the efficacy of doses much smaller than those advocated by Dr. Secher. The large doses originally used were followed in almost every case by reactions of all kinds, often very severe and sometimes with serious results to the patient. For some years I employed a system of doses, beginning with 0·1 g. and working up to 1·0 g., completing the course as a rule in under two months. During the past twelve months, however, I have ceased to give one-gramme doses and have also lengthened the period over which a full course of the drug is given. I begin with 0·05 or 0·1 g. and rarely exceed 0·6 g. as the largest dose. The usual interval between doses is a week. The length of the course depends on the patient's tolerance and weight, an uneventful course usually taking from 12 to 16 weeks according to the total amount of the drug administered. This method of administration is thus similar to that used by Dr. Pask.

In my opinion the great advantage of giving these smaller doses over a prolonged period is the diminution in the incidence and in the intensity of the reactions: this, without any apparent lessening of the beneficial effect of the drug on the tuberculous process. In particular, I note that it is now very rare to find even a trace of albumin in the urine, anorexia is less common and when it does occur it is not so marked. Loss of weight is infrequent. In ambulant patients it is as a rule unnecessary to restrict exercise during the course. Ulceration of the mouth is less frequent and less severe. It occurred in slight degree in only three of my first 20 patients treated by this method of smaller dosage. Diarrhœa likewise occurred only in two patients in this group. In one of them it developed early in the course and lasted ten days. Subsequent doses, however, produced no recurrence and the patient had 7·8 g. in all without any further ill-effect. In the second case the treatment had to be abandoned owing to the diarrhœa.

Of the 20 patients referred to, 11 completed their courses of sanocrysin without any febrile reactions whatsoever. Seven had slight rises of temperature on one or two occasions only. One had a sharp rise of temperature to 104° F., but this settled to normal on the fifth day. The remaining patient had a raised temperature, in the region of 99·6° to 100° (mouth) for nearly three weeks after the second dose (0·25 g.). The sputum, however, which had been persistently positive for at least four months me negative and remained so until the patient's rture three months later, though no further crysin was given. In my experience, moreover, le reactions are unnecessary for the effective ing of the drug. I have at times found on ultation signs suggesting a focal reaction without rise of temperature. Finally, with regard to ile reactions I am under the impression that are more common when the distilled water h is used to dissolve the sanocrysin is taken a a flask or rubber-topped bottle containing a mon supply for several injections rather than n a sealed glass ampoule freshly broken for each ction. In the case of the common supply it is sible that bacterial contamination, in particular h saprophytic organisms introduced into the flask ottle with the needle, provides a source of "protein ck," which may account at least in some measure the febrile reactions sometimes seen when such a hnique is followed. Ten of the patients above rred to showed various cutaneous reactions. eight of them these were exceedingly mild—a few ttered papules or pustules about the body and bs. In the other two there was a generalised thema, followed in one case by desquamation. ese more severe complications necessitated an erruption of the treatment, but the course was npleted in both cases without further incident. th patients lost their tubercle bacilli from the itum shortly after the reaction.

In conclusion, my latest experience with sanocrysin pears to support a system of dosage similar to that ed by Dr. Pask.

I am, Sir, yours faithfully,
HILARY ROCHE.

British Sanatorium, Montana, Switzerland,
Dec. 23rd, 1931.

SURGICAL ASPECTS OF BIRTH CONTROL.

To the Editor of THE LANCET.

SIR,—Mr. Frank Cook's letter in your issue of Dec. 19th reveals a certain sympathy towards Mr. Justice McCardie's views on family limitation, so that it is more the pity that he cannot permit his right hand to follow his heart. The fact that we have no absolutely reliable means of preventing conception, or a 100 per cent. effective and safe method of terminating a pregnancy, merely demonstrates the obvious limitations of man's endeavours. But because there is a mortality-rate in even straightforward tonsillectomy or simple appendicectomy, no one disputes the necessity of the operation. What is the mortality-rate of a curettage and how does it compare with the death-rate in childbirth? Of greater significance, how does it compare with that of inexpert and quack methods of terminating pregnancy? The latter risk, however great it is, will continue to be taken by countless women who definitely *do not want the child,* until the law allows them to take their trouble to their medical attendant. With practice comes perfection (forgive the platitude); we can confidently look forward to advances that will follow proportionally to the extent that the question is given practical consideration and application. There is need for birth control research as there is for cancer research. Why should pathological reasons be the only ones that gain the blessings of the law, when any woman can tell of personal and economic reasons of far greater urgency and significance?

The early statistics of laparotomy do not make pretty reading for modern surgeons; yet neither can one regret the failures that brought the advances, nor, to the best of my knowledge, are the surgeons the less respected in memory. Only by constructive and active measures can be brought about the state of perfection to which Mr. Cook refers, whereas by indifference and inactivity a premium is being placed on the dogmas that surround the subject.

I am, Sir, yours faithfully,
S. CHARLES LEWSEN.

College-crescent, N.W., Dec. 22nd, 1931.

Medical Diary

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

TUESDAY, Jan. 5th.—5.30 P.M., ORTHOPÆDICS. (Cases at 4.30 P.M.) Mr. Norman Capener: Changes in Hip-joint Following Slipped Epiphysis of Femur. Mr. E. P. Brockman: Arthrodesis of Hip for Sunken Acetabulum. Other cases will be shown.

WEDNESDAY.—5 P.M., HISTORY OF MEDICINE. Papers: Mr. E. Muirhead Little: The Introduction of Tubercle into Bone and Joint Surgery. Discussion: Mr. Naughton Dunn, Mr. E. Laming Evans, Mr. McCrae Aitken, and others. Dr. A. P. Cawadias for Dr. Pan. S. Codellas: The Times, Life, Works, and Fragments of Alkmeon of Croton. (To be read in abstract.) Members of the Section of Orthopædics are specially invited to attend. SURGERY. Meeting at the London Hospital. 1.30 P.M., Operating session. 5 P.M., Clinical, Museum, and other demonstrations.

THURSDAY.—8 P.M., TROPICAL DISEASES AND PARASITOLOGY. Paper: Dr. W. Schulemann (Elberfeld, Germany): Synthetic Anti-Malarial Preparations. Synthesis, Discovery and Use of Plasmoquine. Members of the Sections of Medicine, Therapeutics, and the United Services are specially invited to attend.

FRIDAY.—8.30 P.M., OPHTHALMOLOGY. Communications. Miss Ida Mann: The Eye of Sphenodon and Notes on a Living Specimen. Mr. Humphrey Neame: Report on Case of Sarcoma of the Choroid (shown on Nov. 13th). Cases will be shown.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith, W.

MONDAY, Jan. 4th.—10 A.M., Gynæcological Wards; Genito-urinary Operations; Skin Department. 11 A.M., Surgical Wards. 2 P.M., Surgical Wards; Medical, Surgical, Eye, and Gynæcological Out-patients.

TUESDAY.—9.30 A.M., Operations. 10 A.M., Medical Ward Demonstration; Dental Department. 11 A.M., Throat Operations. 11.30 A.M., Surgical Demonstration. 2 P.M., Operations; Medical, Surgical, and Throat Out-patients.

WEDNESDAY.—10 A.M., Medical Wards; Children's Medical Out-patients. 2 P.M., Medical, Surgical, and Eye Out-patients. 2.30 P.M., Gynæcological Operations. 4.45 P.M., Venereal Diseases Demonstration.

THURSDAY.—10 A.M., Neurological Department. 11.30 A.M., Fracture Demonstration. 2 P.M., Medical, Surgical, Eye, and Genito-urinary Out-patients. 2.30 P.M., Operations.

FRIDAY.—10 A.M., Medical Wards, Skin Department, Dental Department, 12 noon, Medical Lecture. 2 P.M., Operations, Medical, Surgical, and Throat Out-patients.

SATURDAY.—9 A.M., Throat Operations. 10 A.M., Medical Wards, Surgical and Children's Out-patients.

KING'S COLLEGE HOSPITAL MEDICAL SCHOOL, Denmark-hill, S.E.

THURSDAY, Jan. 7th.—9 P.M., Dr. E. Mapother: Early Mental Treatment.

ROYAL NORTHERN HOSPITAL, Holloway-road, N.

TUESDAY, Jan. 5th.—3.15 P.M., Mr. E. Wolff: Diplopia.

CENTRAL LONDON THROAT, NOSE, AND EAR HOSPITAL, Gray's Inn-road, W.C.

FRIDAY, Jan. 8th.—4 P.M., Mr. W. A. Mill: Difficulty in Swallowing.

ST. MARK'S HOSPITAL, City-road, E.C.

THURSDAY, Jan. 7th.—4.30 P.M., Mr. L. E. C. Norbury: The Treatment of Certain Atonic and Atrophic Conditions of the Cæcum.

LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital, 49, Leicester-square, W.C.

TUESDAY, Jan. 5th.—5 P.M., Dr. H. Haldin-Davis: Acne Rosacea.

THURSDAY.—5 P.M., Dr. J. M. H. MacLeod: Ringworm Infections.

OBITUARY

SIR WILLIAM BENNETT, F.R.C.S.,

CONSULTING SURGEON TO ST. GEORGE'S HOSPITAL.

WE regret to announce the death of Sir William Bennett at his house in London on Christmas Eve. The end was sudden, but Sir William had been in failing health for some time.

William Henry Bennett was a son of Mr. W. F. Bennett, a Wiltshire landowner, and was born in 1852. He was educated privately and entered St. George's Hospital as a medical student in 1870. He held, after qualification as M.R.C.S., the usual resident appointments at the hospital and proceeded to the F.R.C.S. in 1877, being at that time demonstrator of anatomy at the medical school. His early appointments outside his own hospital were as surgeon to the Seamen's Hospital, to the Hospital of St. John and St. Elizabeth, to the Grosvenor Hospital for Women and Children, and to the Belgrave Hospital for Children, so that from the start of his career he was in possession of unusual clinical opportunities.

SIR WILLIAM BENNETT.

[*Photograph by Lafayette*

In 1880, after an interlude of travel with the late Sir Watkin Wynn, he was appointed assistant surgeon to St. George's Hospital, and immediately made a mark as teacher in the school, while in personal work he secured a fortunate start. His progress on the staff was rapid, for in 1887 he became full surgeon, while his private practice soon became a large one. He was a very careful and resourceful operator, and an especially fine orthopædic surgeon, getting particularly satisfactory results in cases of old injuries and stiff joints, while he was an early advocate of the treatment of fractures by modern methods. He wrote mainly upon these subjects and always from a practical point of view, and his papers and publications on injuries and diseases of the knee-joint, on the treatment of recent fractures by massage, and on the management of stiff joints, were widely read; he contributed also the section upon injuries and diseases of the spine to Treves's "System of Surgery." His writing displayed the qualities of his teaching, which was extremely practical, plain, and straightforward. His demonstrations at the out-patient department of the hospital were especially valued by the students, while in his lectures he had the ability to make the path of the learner smooth, never refining on detail, but always keeping important things in front. He was at different times an examiner for the English Conjoint Board in anatomy, for the Royal College of Surgeons of England in anatomy and in surgery for the Fellowship, and for the University of Cambridge.

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Sir William Bennett's public appointments we very numerous. He was, for many years, H. Inspector of Anatomy; he was surgeon-in-chief St. John's Ambulance Brigade; chairman of Convalescent Homes' Committee, King Edwar Hospital Fund, and of the Lord Wandsworth Ag cultural College; president of the Institute *Hygiene and of the Illuminating Engineers'* Societ and a vice-president of the Seamen's Hospital Soci and of the Invalid Children's Association. discharged the consequent responsibilities scrupulou and *efficiently*.

In private life Sir William was well known as art connoisseur and a collector. He had a fine ta in pictures, and a great knowledge of china, familiarity with the latter being developed by ea experiences in the sale-room. His lameness preclu him from following the usual athletic pursuits of young man, and his original purchases at aucti represented a form of recreation in his spare ti Soon, however, he *developed a real flair*, and the s of his first collection of china made a considera mark in the artistic world, while the prices obtai were a justification of his acumen.

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THE SERVICES

ROYAL NAVAL MEDICAL SERVICE.

E. Flannery and D. Ewart to be Surg. Lts.

following appointments have been made: Surg. mdr. (D.) D. C. Eglington to R.N. Barracks, Chatham. Lt. (D.) F. Goldsworthy to *Malaya*.

ROYAL ARMY MEDICAL CORPS.

TERRITORIAL ARMY RESERVE OF OFFICERS.

s. L. J. Blandford and J. Mackinnon, and Lt.-Cols. Everett and N. Maclaren, having attained the age retire, and retain their rank, with permission to wear prescribed uniform.

ıj. H. T. Jones and Capt. C. H. Gibb, having attained age limit, relinquish their commns., and retain their

INDIAN MEDICAL SERVICE.

-Col. W. D. Wright retires.

M. R. Sinclair to be Capt. (prov.).

ıe prob. appts. of the undermentioned officers are ırmed:—

) be Capt.: Capt. M. H. Wace.

) be Lts.: Aziz Khan Mohamed Khan (now Capt. v.)), F. H. A. L. Davidson, R. T. Hicks, D. J. Young, Dracup, D. McCarthy, and P. L. O'Neill.

MEDICAL NEWS

versity of Durham.

n Dec. 19th, 1931, the following degrees and diplomas conferred:—

D. for Practitioners of 15 *years' standing.*—O. R. McEwan, . Pennant, J. R. B. Robb, and T. H. Thomas.

B., B.S.—M. J. Arnott, R. D. Burn, G. S. Clark-Maxwell, Forrest, H. U. G. Harrison, J. A. Miller, and P. N. Rampal.

Hy.—F. C. S. Bradbury, B. A. Dormer, W. E. Hargreaves, J. H. F. Pankhurst.

P.H.—F. C. S. Bradbury, B. A Dormer, W. E. Hargreaves, J. H. F. Pankhurst.

iversity of Sheffield.

r. H. Florey has been appointed professor of pathology Dr. J. W. Edington professor of bacteriology in the iversity.

t recent examinations the following candidates were cessful:—

CH. M.

E. Larks.

FINAL EXAMINATION FOR M.B., CH.B.

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st-graduate Course on Nervous Diseases.

At the National Hospital, Queen-square, London, W.C., ost-graduate course on Diseases of the Nervous System l be held from Jan. 25th to March 18th. The general ırse will consist of 32 clinical lectures and demonstrations 3.30 P.M. each weekday, except Wednesday and Saturday, h teaching in the out-patient department on each week- y except Saturday, at 2 P.M., and eight pathological tures and demonstrations on Fridays at noon. Ten tures on the Anatomy and Physiology of the Nervous stem will be arranged on Tuesdays and Thursdays at on if there are enough applicants, and ten clinical demon- ations, chiefly on Methods of Examination of the Nervous stem, will be given on Tuesdays and Thursdays at 5 P.M. ckets entitling the holders to attend the out-patient clinic three months may be had from the secretary of the edical school, to whom all applications should be addressed.

ampstead General and North-West London Hospital.

The second winter session of the Post-graduate School this hospital will open at 4 P.M. on Jan. 6th, when ord Riddell will give an address on the Ethics of Abortion, erilisation, and Birth Control. On succeeding Wednesdays the same hour lectures will be given by Dr. Adolphe brahams (Dietetic Facts, Fads, and Figments), Mr. George augh (Surgical Lesions due to Pneumococcal Infections), r. J. A. Alison Glover (Tonsillitis), Mr. Sidney Boyd emonstration of surgical cases), Dr. W. E. Gye (Cancer), r. W. H. Ogilvie (Common Injuries of the Wrist), Dr. H. ourtney Gage (X Ray Diagnosis of Diseases of Alimentary ract), Mr. A. Sorsby (Ophthalmoscope in Cardiovascular isease), Dr. H. C. Semon (Diseases of the Buccal Mucosa), r H. M. Oddy (Chronic Arthritis), and Mr. H. Lawson hale (Sinusitis and the Common Cold).

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Dr. O. L. V. de Wesselow, F.R.C.P., has been appointed as from Dec. 1st, 1931, to the university chair of medicine tenable at St. Thomas's Hospital Medical School. Since 1920 he had been chemical pathologist to St. Thomas's Hospital.

Department of Health for Scotland.

Dr. John M. Johnston, at present Pollok lecturer in pharmacology and therapeutics in the University of Glasgow, has been appointed a medical officer in this department.

Pharmaceutical Society of Great Britain.

A meeting of this society will be held at 17, Bloomsbury-square, London, W.C., at 8.30 P.M. on Tuesday, Jan. 12th, when Mr. Walter Deacon will lecture on the Romance of Perfumes.

Royal Empire Society.

Colonel F. E. Fremantle, M.P., will give an address on the Debt of the Empire to British Medical Research at a meeting of this Society at the Hotel Victoria, at 8.30 P.M. on Tuesday, Jan. 19th, with Sir William Willcox in the chair. Application for tickets should be made to the secretary of the Royal Empire Society, Northumberland-avenue, W.C. 2. A dinner will precede the meeting at 7 P.M.

St. Peter's Hospital.

Weekly lectures will be given at St. Peter's Hospital, 10, Henrietta-street, Covent Garden, London, W.C., on Wednesday afternoons at 3 P.M. (in the pathological department). The first lecture, on Jan. 20th, will be by Mr. J. Swift Joly, who will speak on the Examination of Urological Patients.

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The eighteenth annual conference of this association will be held at University College, London, from July 21st to 23rd. The jubilee of the discovery of the tubercle bacillus by Robert Koch will be made a feature of the conference. The address of the association is Tavistock House North, Tavistock-square, W.C. 1.

Presentation to Prof. Blair Bell.

At the annual dinner of the Medical Students' Debating Society of the University of Liverpool, Prof. W. Blair Bell, President of the British College of Obstetricians and Gynæcologists, was presented with his portrait, painted in oils by Mr. J. A. A. Berrie. Prof. Blair Bell, who is retiring from the chair of obstetrics and gynæcology, said that he valued the gift the more because it was the first time that the students had presented a portrait to one of their teachers.

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At the general meeting of the League held on Dec. 18th, at the headquarters, 12, Stratford-place, London, W., the founder and honorary organiser (Miss Olga Nethersole, R.R.C.) said that it had been in existence for twelve and a half years and during that time eleven travelling scholarships had been awarded. Prof. D. F. Fraser-Harris, medical secretary to the League's bovine tuberculosis investigation, reported that the special committee appointed to deal with the problem had after eighteen months' close study finished its work and would shortly issue a report.

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Psychological Problems of Childhood.

The Child Guidance Clinic of the Jewish Health Organisation of Great Britain announces that a short course of lectures on this subject will be given on Tuesdays and Thursdays at 5.30 P.M., beginning on March 1st, at a place to be stated later. It is intended primarily for members of the medical profession and medical students, and will only be held if the number of applicants is not less than 15, but a limited number of others interested in the subject may be admitted if found eligible by the honorary director. In association with the lectures there will be clinical demonstrations. Particulars about the place may be had from the honorary director of the Clinic, Jews' Free School, Bell-lane, Spitalfields, London, E.1.

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e Capt.: Capt. M. H. Wace.

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Post-graduate Lectures on Obstetrics.

Lectures will be given at the City of London Maternity Hospital, City-road, E.C., at 5.30 P.M. on Thursdays from Jan. 14th to Feb. 25th. The lecturers will be Dr. J. Abernethy Willett (Lessons Learned from Emergency Admissions), on Jan. 14th; Mr. W. McK. McCullagh (Maternal Mortality), on the 21st; Mr. Arnold Walker (Treatment of Contracted Pelvis), on the 28th; Mr. H. Burt-White (Puerperal Infection), on Feb. 4th; Dr. Sydney Owen (the Newly-born Baby), on the 11th; Dr. H. C. Lucey (the Pathology of Pregnancy), on the 18th; and Mr. R. Christie-Brown (Treatment of Hæmorrhage), on the 25th.

Psychological Problems of Childhood.

The Child Guidance Clinic of the Jewish Health Organisation of Great Britain announces that a short course of lectures on this subject will be given on Tuesdays and Thursdays at 5.30 P.M., beginning on March 1st, at a place to be stated later. It is intended primarily for members of the medical profession and medical students, and will only be held if the number of applicants is not less than 15, but a limited number of others interested in the subject may be admitted if found eligible by the honorary director. In association with the lectures there will be clinical demonstrations. Particulars about the place may be had from the honorary director of the Clinic, Jews' Free School, Bell-lane, Spitalfields, London, E.1.

OBITUARY

SIR WILLIAM BENNETT, F.R.C.S.,

CONSULTING SURGEON TO ST. GEORGE'S HOSPITAL.

We regret to announce the death of Sir William Bennett at his house in London on Christmas Eve. The end was sudden, but Sir William had been in failing health for some time.

William Henry Bennett was a son of Mr. W. F. Bennett, a Wiltshire landowner, and was born in 1852. He was educated privately and entered St. George's Hospital as a medical student in 1870. He held, after qualification as M.R.C.S., the usual resident appointments at the hospital and proceeded to the F.R.C.S. in 1877, being at that time demonstrator of anatomy at the medical school. His early appointments outside his own hospital were as surgeon to the Seamen's Hospital, to the Hospital of St. John and St. Elizabeth, to the Grosvenor Hospital for Women and Children, and to the Belgrave Hospital for Children, so that from the start of his career he was in possession of unusual clinical opportunities.

SIR WILLIAM BENNETT.

[Photograph by Lafayette

In 1880, after an interlude of travel with the late Sir Watkin Wynn, he was appointed assistant surgeon to St. George's Hospital, and immediately made a mark as teacher in the school, while in personal work he secured a fortunate start. His progress on the staff was rapid, for in 1887 he became full surgeon, while his private practice soon became a large one. He was a very careful and resourceful operator, and an especially fine orthopædic surgeon, getting particularly satisfactory results in cases of old injuries and stiff joints, while he was an early advocate of the treatment of fractures by modern methods. He wrote mainly upon these subjects and always from a practical point of view, and his papers and publications on injuries and diseases of the knee-joint, on the treatment of recent fractures by massage, and on the management of stiff joints, were widely read; he contributed also the section upon injuries and diseases of the spine to Treves's "System of Surgery." His writing displayed the qualities of his teaching, which was extremely practical, plain, and straightforward. His demonstrations at the out-patient department of the hospital were especially valued by the students, while in his lectures he had the ability to make the path of the learner smooth, never refining on detail, but always keeping important things in front. He was at different times an examiner for the English Conjoint Board in anatomy, for the Royal College of Surgeons of England in anatomy and in surgery for the Fellowship, and for the University of Cambridge.

Bennett's war experiences were limited by the of his lameness, but his services to the sick a wounded on their return from the Boer War we particularly prominent; he was publicly thanked for them by Lord Roberts, and was appointed K.C.V.O. in 1901. At the outbreak of the recent he retired from private practice and resigned all his appointments to work for the British Red Cross and Order of St. John, and to serve on the staff of emergency hospitals. He was appointed surgeon to King Edward VII. Hospital, and took charge of beds in various auxiliary institutions, supervising also several invalid and convalescent homes. For the services he was appointed Knight of Grace of the Order of St. John of Jerusalem and also of the Roy Order of the Redeemer of Greece.

Sir William Bennett's public appointments were very numerous. He was, for many years, H.M. Inspector of Anatomy; he was surgeon-in-chief of St. John's Ambulance Brigade; chairman of the Convalescent Homes' Committee, King Edward's Hospital Fund, and of the Lord Wandsworth Agricultural College; president of the Institute of Hygiene and of the Illuminating Engineers' Society, and a vice-president of the Seamen's Hospital Society and of the Invalid Children's Association. He discharged the consequent responsibilities scrupulously and efficiently.

In private life Sir William was well known as an art connoisseur and a collector. He had a fine taste *in pictures, and a great knowledge* of china, his familiarity with the latter being developed by early experiences in the sale-room. His lameness precluded him from following the usual athletic pursuits of the young man, and his original purchases at auctions represented a form of recreation in his spare time Soon, however, he developed a real flair, and the sale of his first collection of china made a considerable mark in the artistic world, while the prices obtained were a justification of his acumen.

Sir William Bennett was twice married, his first wife being Isabel, daughter of the late Dr. Thomas Dickinson, a well-known practitioner in Sloane-street, London, and his second, Gladys, daughter of the Rev. Allen S. Hartigan, of St. Leonards-on-Sea. He had no children by either marriage.

ADDITIONS TO CLAYTON HOSPITAL, WAKEFIELD.—The foundation-stone has recently been laid of a radiological and therapeutic department of this institution The new building is a gift from the West Yorkshir joint district miners' welfare committee which has mad a grant of £12,000. The cost will not exceed £9000; th balance will provide the plant for superficial therapy leaving a further £3000 to be raised for deep therap equipment.

WINTER IN ENGLAND.—We have received from *the joint secretaries of the movement for* promotin the resources of British health resorts the announcemen of the next step to be taken by the executive committee. The intention is to coördinate efforts to brin to the attention of the public the merits of the Britis resorts for winter residence, and it is hoped to establish central bureau at which information can be obtained. public meeting will be held at the Institute of Hygien lent by the Council of that body, on Monday, Jan. 11th 1932, at 3.30 P.M., when the objects of the committee w be fully stated and explained. A conference has also bee arranged to take place at Paignton, Devon, later in th year, with a similar purpose.

e to the conclusion that there is seldom any on to suppose that the cracking of the joints in r parts of the body is in any way different to the king of the finger-joints. Operators may affirm, patients willingly believe, that dislocations or uxations are being reduced and bones pushed k into place, yet I am firmly of the belief that is not so, but that in the majority of instances *joint surfaces have merely been separated.* Here. n, is an obstacle to our reasoning, for why should es be effected by such a simple measure? We apt to think the whole thing humbug, and forget fact that the patient feels better. Suppose, vever, we approach the subject in another way. us grant that patients are cured after certain nipulations, then there must have been something ong before the manipulation. Do not let us qualify t by saying that what was wrong was in the ient's imagination, for very few people desire to ill. All we know is that there was something ong, though we could not detect it clinically or by ray examination.

A Static Disability.

We must remember that an X ray photograph simply the record of a shadow, and we might nsider some conditions that would not be revealed. r instance, with few exceptions, adhesions would t be shown. Any limitation of movement would t be shown, though this might be deduced if the otograph showed actual fracture or dislocation or oss bony lesion. Nor does it indicate whether the echanism by which the joint is actuated is normal, d it is in this connexion that we may find some asonable explanation of the value of what might termed manipulative therapy.

In the simplest joint the movement is confined to exion and extension. There are other joints where ore highly specialised actions—rotation, circum-uction, &c.—come into play, but for our purpose e may simply consider those joints where flexion nd extension are the predominant movements. Thus the terminal interphalangeal articulation we have beautiful example of a hinge-joint, actuated by exor and extensor muscles, but these muscles act nly in one plane. No provision is made for lateral ovement, this, on the contrary, being prevented by teral ligaments. Nor is there any means of move-ent of a rotatory nature; so it is impossible by ny amount of voluntary action to turn the finger ound till the nail faces the same way as the palm f the hand. Conversely, if by violence that joint e put into a state of lateral flexion or rotation, then here is no active muscular effort which will bring the ones back into proper alignment. Moreover, if we ould imagine the joint rotated through 180 degrees, ven without any tearing of the muscles or ligaments, t is doubtful if the muscles would be able to function t all. But far short of such a condition the power f the muscles is beginning to fail. This we can ry for ourselves. Grasp the middle and terminal phalanges of one forefinger firmly in the other hand and forcibly rotate them, when it will be found almost impossible voluntarily to flex the finger at either of the interphalangeal joints.

Muscles, then, have been developed to act most powerfully with their fibres in a certain direction. Any torsion of the muscle or tendon will diminish its power, and we can see from that experiment what little rotation is necessary to put it out of use—so little, in fact, that the joint displacement would not be noticed on an X ray photograph.

Thus far we have considered movements in unusual planes, but if we think of a backward displacement of a finger-joint we have a condition where the opposing sets of flexor and extensor muscles, though still in their usual plane, are unable to function. This may be because there is no mechanism for voluntarily putting traction on the joint—i.e., separating the joint surfaces and thus facilitating the return of the bones to their proper alignment—but is more probably due to another factor, as may be seen in the wrist. Remember that the opposing sets of muscles moving a joint must always act harmoniously together. In flexion the flexors do most of the work, yet the extensors do not play merely a passive part. On the contrary they are actively engaged in paying out slack, so that the movement is steady and controlled, and vice versa, else we would have a flail joint; but there seems to be an optimum position or angle for these opposing muscles to function. Thus the strongest grip is obtained with the wrist dorsiflexed. This gradually weakens till in extreme flexion of the wrist there is scarcely any grip, and we can imagine a position where the muscles are unable to function. Such position, apart from actual dislocation, would probably be a point just beyond extreme flexion or extension.

There would thus appear to be a point which I would liken to the dead centre of the driving wheel of an engine. As we are all aware from playing with toy engines, or working lathe or treadle machines, if the driving wheel has stopped at a certain point no amount of energy expended by the piston will move the wheel, whereas if the wheel be slightly rotated by hand, or if it be levered over the dead centre, the engine again begins to function. But there was never any suggestion that anything had slipped out of place.

Some Conclusions.

I give no detailed descriptions of the manipulations employed. I have simply attempted to clear up certain points wrapt in mystery, and we are now in a position to review the subject as follows.

1. Not unlikely there may be a joint condition which is not shown on an X ray photograph—a state of fixation either in flexion or in extension, or a strain due to or accompanied by a torsion of the muscles, each of them difficult to detect clinically, and all of them accompanied by some pain on pressure, and perhaps with a certain amount of disability or discomfort.

2. During manipulation the joint surfaces are merely separated. The work done is in a way akin to what the engine driver or mechanic does when he levers the driving wheel over the dead centre. Nature is all the time trying to pull the bones into their proper place, and at the moment of separation the opportunity presents itself for things, as they fly back, to rearrange themselves properly. It is not necessary to hear a pop: the pop simply tells us that the joint has been put through its full range of movement.

3. Bone-setters, osteopaths, and chiropractors do not diagnose the joint condition in the terms we have just explained, but speak of dislocations, bones being out, lesions, or subluxations, to signify what they believe to be wrong. It is sometimes argued that patients understand about a bone being out, and that is an expression which they readily accept. That, however, is not quite fair. The joint is, if you like, out of order—it is not functioning properly. When a patient's kidneys or bowels are not functioning properly he is told that these particular organs are out of order, but not that they are out of place.

4. Although they sometimes give a "specific" manipulation, that is, try to make the bones move back along the path through which they have already travelled, they more often trust to luck with a general manipulation. In other words they make a quick diagnosis that there is something wrong with the joint, and simply make the movement of separating the articular surfaces, hoping for the best: and it is surprising how often this succeeds.

5. If anyone is still inclined to think that the popping of joints means the reduction of dislocations, let him try the corresponding joints on the other side of the body. For example, in the treatment of "tennis elbow" a manipulation is often done at the radio-humeral joint, and a distinct click produced. This is often taken to mean, and bone-setters insinuate, that something has been pushed back into place. But if the other elbow—which is presumably sound—be manipulated in the same way, an exactly similar

NOTES, COMMENTS, AND ABSTRACTS

ON BONE-SETTING.*

BY THOMAS MARLIN, M.D. GLASG., D.P.H., D.M.R.E.,

PHYSICIAN IN CHARGE OF THE MASSAGE, LIGHT, AND ELECTRO-THERAPEUTIC DEPARTMENTS AT UNIVERSITY COLLEGE HOSPITAL AND HAMPSTEAD GENERAL HOSPITAL, LONDON.

A STUDY of bone-setting presents peculiar difficulties. It has generally been surrounded by so much quackery, and accompanied by such exaggerated statements, that our profession as a rule has fought shy of getting mixed up with it. Although at times articles have appeared *about* bone-setting, very little help has been given us in the way of useful descriptions of the manipulations. Very few medical men have acquired any skill in the technique employed for different joints, and little or nothing is taught to students, so for our purpose we will assume that the sum of our knowledge is what we have gained by listening to patients who have been treated by bone-setters.

What is the usual story? "I went to so-and-so, and he put back certain bones in my spine which were out of place. I know he put them back because I felt them go, and also heard the noise of them going back into place." Or "I went to another man and he put back five or seven bones in my ankle. I heard them go back with a crack." Or "I went to yet another man and he found a bone 'out' in my elbow or hand and put it back." In each case the patient was impressed with the sound of the bone going back into place.

And what is our attitude? Perhaps we are too apt, in our search after objective signs, to discount much of what our patients tell us. Let us take a concrete example. Some years ago, at a certain London hospital, a woman was sent to me for massage and electrical treatment for pain in her thumb. The pain was situated round the back of the carpo-metacarpal joint, and the patient's impression was that there was something "out." The condition did not respond to the usual treatments, and several X ray photographs were then taken from different angles, corresponding views being taken of the sound hand for comparison. No abnormality was detected in the photographs, and movement was apparently free in all directions, but that did not satisfy the patient, who still insisted that there was a bone out of place. Was this, I wondered, just the type of case which would add to my mortification by drifting to a bone-setter and possibly getting relief? If so, why should not I myself try manipulation?

With one hand I grasped her thumb and applied traction, while the thumb of my other hand applied pressure to the back of her first metacarpal bone at its base. On sharply increasing this pressure I was agreeably surprised to feel the bone move quite distinctly with an audible click, and the patient heaved a sigh of relief saying we had done the trick. Firm hold was kept of her hand till we were ready to take another series of X ray photographs from the same angles as the previous set. I expected to see some shift of the bone registered, but after carefully examining the different sets had to admit that no difference whatever could be detected.

Now several points present themselves for consideration.

1. From that moment the patient was well.
2. Did I bluff the patient? She had maintained that something was out: did my action merely assure that her diagnosis was right, and did that assurance work the cure? Certainly had it been done by some unqualified person I should have been inclined to think it a very good bluff.
3. Perhaps the patient merely imagined she had pain. Against this was the fact that she was a charwoman, anxious to keep at work, and had no time for such nonsense.
4. The gratitude of the patient was genuine. By some means she found out my private address, and sent me a box of cigars as a Christmas present some months afterwards.
5. As no abnormality was detected by carefully examining the X ray photographs, what could have been the condition of the joint prior to the manipulation, and what actually happened during the manipulation?

The fact that the patient felt better merely causes us to shrug our shoulders, and had the manipulation been done by a bone-setter that would only serve to increase our scepticism. But similar cases are thrusting themselves on us with such insistence that sooner or later we are bound to take notice. Few of us ever see any of this so-called bone-setting, and one of our troubles has been to explain the crack which the patient heard. We argue, soundly, that as there was no displacement shown by X ray examination the manipulator did not put any bones back into place, even though he claimed to have done so The only explanation we have seen brought forward is that the sound is due to the breaking down o adhesions.

Now undoubtedly there was a time when fracture were treated by long immobilisation, and adhesion formed which had to be broken down. This i probably where bone-setters scored in previous days but nowadays fractures are treated in quite a differen way, and stiff joints do not so often result. But even should that happen, then the value of breaking down adhesions is quite well understood by medical men and, in fact, this operation is constantly being don by them. It is most often done under a genera anæsthetic, and the technique does not require any elaboration here. If any comment were necessary it would be to advise the operator not to attemp too much at one sitting. Only a small amoun should be done at a time, and immediately afterward massage and movements should be started to maintai what little mobility has been attained. Whe adhesions are broken down there is a characteristi tearing felt by the operator, and there are subsequen pain and effusion according to the amount done The force employed is a steady one, and the strengt necessary may be very considerable, according t the tenacity of the adhesions. It will be observe that this is not strictly a joint manipulation, but i an operation to break down adhesions round th joint, and so allow the bones to move through greater range of movement.

"Springing the Joints."

There is, however, a manipulation which may b described as springing the joints, and probably thi is the manœuvre most commonly employed by bone-setters. This is accomplished by carrying th joint either into extreme flexion or extension, and then with a sudden, sharp, but guarded thrust o jerk, that particular position is slightly exaggerated Or it can be done by either steady or sudden traction Thus we are all familiar with people who are able to crack their fingers by pulling or by forcibly bending them. Also it is possible to make the elbow crack with the joint extended, and the ankle will often give during traction. In these cases there is no question of breaking down adhesions. The force i sudden and not of sufficient strength to do so, and there is seldom any subsequent pain or effusion.

Perhaps the most reasonable assumption is that a vacuum is formed when the joint surfaces are separated, and the sound is due to the sudden rush of gases into the vacuum. This view is furthe supported by the fact that, generally speaking, it is impossible to crack a second time before the lapse o a considerable interval—i.e., apparently not until the gas in the joint has been reabsorbed by the tissues.

Having watched and treated many cases, I have come to the conclusion that there is seldom any reason to suppose that the cracking of the joints in other parts of the body is in any way different to the cracking of the finger-joints. Operators may affirm, and patients willingly believe, that dislocations or subluxations are being reduced and bones pushed back into place, yet I am firmly of the belief that that is not so, but that in the majority of instances the *joint surfaces have merely been separated.* Here, then, is an obstacle to our reasoning, for why should cures be effected by such a simple measure? We are apt to think the whole thing humbug, and forget the fact that the patient feels better. Suppose, however, we approach the subject in another way. Let us grant that patients are cured after certain manipulations, then there must have been something wrong before the manipulation. Do not let us qualify that by saying that what was wrong was in the patient's imagination, for very few people desire to be ill. All we know is that there was something wrong, though we could not detect it clinically or by X ray examination.

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* From a lecture delivered to the Hampstead and North-West London Post-Graduate Society.

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We must remember that an X ray photograph is simply the record of a shadow, and we might consider some conditions that would not be revealed. For instance, with few exceptions, adhesions would not be shown. Any limitation of movement would not be shown, though this might be deduced if the photograph showed actual fracture or dislocation or gross bony lesion. Nor does it indicate whether the mechanism by which the joint is actuated is normal, and it is in this connexion that we may find some reasonable explanation of the value of what might be termed manipulative therapy.

In the simplest joint the movement is confined to flexion and extension. There are other joints where more highly specialised actions—rotation, circumduction, &c.—come into play, but for our purpose we may simply consider those joints where flexion and extension are the predominant movements. Thus in the terminal interphalangeal articulation we have a beautiful example of a hinge-joint, actuated by flexor and extensor muscles, but these muscles act only in one plane. No provision is made for lateral [illegible] this, on the contrary, being prevented by [illegible] ments. Nor is there any means of movement of a rotatory nature; so it is impossible by any amount of voluntary action to turn the finger round till the nail faces the same way as the palm of the hand. Conversely, if by violence that joint be put into a state of lateral flexion or rotation, then there is no active muscular effort which will bring the bones back into proper alignment. Moreover, if we could imagine the joint rotated through 180 degrees, even without any tearing of the muscles or ligaments, it is doubtful if the muscles would be able to function at all. But far short of such a condition the power of the muscles is beginning to fail. This we can try for ourselves. Grasp the middle and terminal phalanges of one forefinger firmly in the other hand and forcibly rotate them, when it will be found almost impossible voluntarily to flex the finger at either of the interphalangeal joints.

Muscles, then, have been developed to act most powerfully with their fibres in a certain direction. Any torsion of the muscle or tendon will diminish its power, and we can see from that experiment what little rotation is necessary to put it out of use—so little, in fact, that the joint displacement would not be noticed on an X ray photograph.

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There would thus appear to be a point which I would liken to the dead centre of the driving wheel of an engine. As we are all aware from playing with toy engines, or working lathe or treadle machines, if the driving wheel has stopped at a certain point no amount of energy expended by the piston will move the wheel, whereas if the wheel be slightly rotated by hand, or if it be levered over the dead centre, the engine again begins to function. But there was never any suggestion that anything had slipped out of place.

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3. Bone-setters, osteopaths, and chiropractors do not diagnose the joint condition in the terms we have just explained, but speak of dislocations, bones being out, lesions, or subluxations, to signify what they believe to be wrong. It is sometimes argued that patients understand about a bone being out, and that is an expression which they readily accept. That, however, is not quite fair. The joint is, if you like, out of order—it is not functioning properly. When a patient's kidneys or bowels are not functioning properly he is told that these particular organs are out of order, but not that they are out of place.

4. Although they sometimes give a "specific" manipulation, that is, try to make the bones move back along the path through which they have already travelled, they more often trust to luck with a general manipulation. In other words they make a quick diagnosis that there is something wrong with the joint, and simply make the movement of separating the articular surfaces, hoping for the best: and it is surprising how often this succeeds.

5. If anyone is still inclined to think that the popping of joints means the reduction of dislocations, let him try the corresponding joints on the other side of the body. For example, in the treatment of "tennis elbow" a manipulation is often done at the radio-humeral joint, and a distinct click produced. This is often taken to mean, and bone-setters insinuate, that something has been pushed back into place. But if the other elbow—which is presumably sound—be manipulated in the same way, an exactly similar

sound is produced, and no one is likely to argue that the sound elbow had anything " out."

6. Similar sounds can be produced during spinal manipulation. Medical men seldom see any of this work, but I shall never forget the profound impression made on me when I first saw any of it done, and I have never given a first demonstration to any of my colleagues without noting their extreme amazement that such a thing can possibly be done. How wonderful, then, the impression that can be made on patients. They are told in a very confident and emphatic manner that there is a subluxation, a dislocation, or a lesion at a certain part of their spine, from which all their trouble originates. They say to themselves that all this time no doctor has examined their back, yet they come here and this man puts his finger on the very spot. At the back of their minds they conjure up pictures of hopeless cripples with spinal deformity, but this man is very clever and will put them right. Some keep going for years for the " spinal adjustments," partly from admiration of the operator's diagnostic and manipulative skill, and partly through fear of the dire consequences of leaving off the treatment.

7. Bone-setters do not set bones. No one, no matter how ill-informed, would ever dream of going to a bone-setter to have a recent fracture of his arm or thigh attended to, but gladly entrusts this to the badly abused medical practitioner.

RAT EXTERMINATION IN HUNGARY.

THE systematic extermination of rats by means of poison is being attempted by the Budapest Board of Health in view of the immense damage to public health and private property caused by their depredations. The new regulations have been the occasion of a review of the history of the campaign against rats from the earliest times by Dr. E. Nádor, who draws attention to the great variation in the methods of extermination tried. He points out that few have been really successful even for a short period. In Egypt cats were regarded as holy animals because they were observed to kill vast numbers of rats in storehouses containing cereals. But neither cats nor specially trained dogs could exterminate the pest. In the Middle Ages rat charmers abounded. The legend that they were able to entice rats to follow the tunes of a flute or pipe may have been based on their use of poisons, of which the secret was handed down from father to son, and is now lost.

Experiments have been made with different poisons, sometimes with disastrous consequences not only to rats but also to domestic animals, and indirectly to human beings. The use of strychnine, phosphorus, and arsenic has done much damage to animals other than rodents, and weaker poisons have therefore been sought. Barium and thallium were tried but were also found to be dangerous. In quite recent times attempts at rat extermination with thallium caused a man's death in Budapest. The next step in scientific rat extermination was the introduction of bacteria which were meant to produce gastro-intestinal disease in rats, though innocuous to human beings. These bacterial cultures were of little permanent avail, however, because after a certain time the rats became immune to them. They proved efficacious, however, against rural rats, causing widespread epidemics and a significant decrease in numbers. About the end of last century in Greece rural rats appeared in vast numbers in a certain agricultural district, causing great damage. The Greek Government called in Prof Löffler from Germany. He succeeded in preparing a culture which met with great success.

The next phase in rat extermination was the introduction of the use of poison gases. These proved very useful in docks and ships where it is possible to exclude from the field of operation all human beings and domestic animals. More recently attempts had been directed to the discovery of substanc poisonous to rats and innocuous to other animals a to man. *Attention was drawn to the fact* that in t southern parts of Europe a plant, *Scilla maritim* is successfully used against rats though innocuo to man unless the dose is very large. Unfortunate the substance poisonous to rats, is not always prese in the same proportion in the plant. If too litt is taken poisoning does not occur, whereas if is present in large quantity it has an irritating acti upon the stomach and the rat vomits it. It is hope that a substance has now been found in which is com bined the virtues and none of the disadvantag of the poisons hitherto used. It is said to be effic cious in exterminating rats from cities and rur districts if it is used simultaneously over large area

LOCAL GOVERNMENT LAW.

THE principles of local government law in th country, the relations between the central and loc authorities, the powers and finance of local bodie and the control exercised by the law-courts a expounded in an admirable little book by Mr. W. Jennings.[1] As a part of his subject he briefly sketch the progress of public health from the Act of 18 onwards, the appointment of the General Board Health (with the great sanitary reformer Chadwi as one of its commissioners), and the unpopulari which the Board's activities encountered. When t Board, initially created for five years only, w prolonged for another year and was then reforme Chadwick's name was omitted from the commissio " Æsculapius and Chiron," wrote the *Times*, " in t forms of Mr. Chadwick and Dr. Southwood Smit have been deposed, and we prefer to take our chan of cholera and the rest, than to be bullied into health Subsequent changes somewhat relaxed central co trol. It is no doubt true to say that improveme has come about not because of compulsion from t centre but because of a genuine local demand f better services. Founded on lectures delivered in t universities of Leeds and London, Mr. Jennings' boo is to be commended not only to academic studen but also to others who take a practical part in loc government.

ELEMENTS OF PHYSICAL ANTHROPOLOG

AN introduction to physical anthropology recent published is intended for the amateur or beginner who anatomical knowledge is not great, and provides useful elementary survey. Mr. Stibbe deals with t subject zoologically, palæontologically, and ethn logically, in a lucid and interesting manner. A goo though short section on practical anthropologic measurement and examination is included.

HISTORICAL HANDBOOKS IN MEDICAL SCIENCE.

THE third member of the series of small handboo dealing with the history of medical science, produce under the appropriate group-title of " *Clio Medica*, is devoted to anatomy.[3] It is an excellent little boo full of items of information which seem to be uniform reliable. Prof. Corner provides readable sho chapters on histology, embryology, and neurolog and on modern trends, and includes some interestin reproductions of old illustrations. A list of grea importance to the reader whose classical lore ha become threadbare, is given of the old-time autho whose works can be obtained in modern language

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[1] Principles of Local Government Law. By W. Ivor Jenning M.A., LL.B., Reader in English Law in the University London; legal editor of the Local Government Chronicl London: University of London Press. 1931. Pp. 263. 6*s.*

[2] An Introduction to Physical Anthropology. By E. Stibbe, F.R.C.S., Senior Demonstrator in Anatomy at Universit College, London. London: Edward Arnold and Compan Pp. 200. 12*s.* 6*d.*

[3] Clio Medica. III. Anatomy. By George W. Corner, M.D. Professor in the University of Rochester. New York: Paul Hoeber, Inc. Pp. 82. $1.50.

ADDRESSES AND ORIGINAL ARTICLES

INJURIES OF TENDONS AND MUSCLES.*

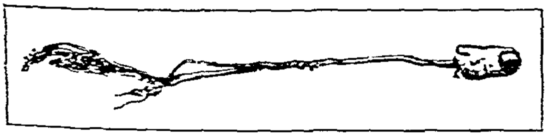
By Harold C. Edwards, M.S. Lond., F.R.C.S. Eng.,
ASSISTANT SURGEON TO KING'S COLLEGE HOSPITAL AND THE EVELINA HOSPITAL.

By virtue of its power of contraction, muscle may of its own accord be responsible for damage to itself or to its tendons of origin and insertion. Under normal conditions the force of contraction is balanced by the tensile strength of the muscle and its attachments, so that the most powerful contraction of the largest muscle may be carried out without fear of injury. If, however, abnormal conditions are present which will reduce the tensile strength or momentarily increase the contractile power, rupture at some point between the origin and insertion of the muscle may occur.

The importance of the contractile power of muscle in relation to injury does not end here however. A contracted muscle is less able to escape injury than a relaxed one, a fact well appreciated by the professional clown, who, by a trick of relaxing his muscles, escapes from the most incredible falls without injury.

A muscle when struck, contracts. Part of any resulting injury is due to the blow and part to the contraction, and it is impossible in most cases to assess the relative importance of the blow and of the contraction in determining the extent of the injury. When a rider jumps into the saddle, the adductors of the thigh contract when the thighs come into contact with the sides of the saddle, but a moment later the thighs are forced apart as the body falls heavily into the saddle, and lastly more violent contraction of the adductors may be made to retain the seat, and rupture of the adductor longus may occur.

FIG. 1.



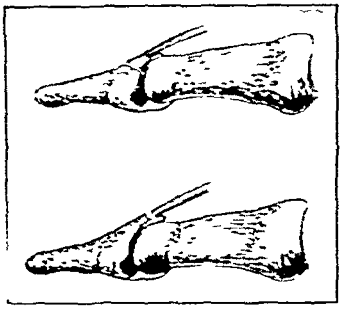
In view of these facts, it is impossible to arrive at a satisfactory classification of muscle and tendon injuries from the ætiological standpoint, and the attempts to do so—many ingenious, all unwieldy and inaccurate—bear evidence to this. As a classification is essential to form a basis for discussion, I shall use the following, which, though admittedly incomplete, has at least the virtue of simplicity. 1. Closed, or subcutaneous injury: (*a*) from external violence (direct and indirect); (*b*) from muscular violence. 2. Injury through open wounds.

Closed or Subcutaneous Injury.

DIRECT VIOLENCE.

A direct blow upon a muscle may produce a temporary inhibition of power without evidence of rupture of muscle-fibres. Such a condition is not uncommon after blows upon the deltoid and quadriceps, and is well known to boxers and Rugby players. The paralysis passes off after a few moments, but may leave the muscle weak for a considerable time. The phenomenon is little understood. It may be due to temporary damage to the nerve-endings within the muscle, as suggested by Ombredanne,[1] but I think it may arise solely from the pain caused by the blow upon the underlying periosteum, for a similar temporary paralysis of the quadriceps may follow a sharp blow upon the patella. Partial ruptures of muscles are of common occurrence from direct blows, and do not call for special comment. Tendons themselves are rarely injured in this way.

FIG. 2.



INDIRECT VIOLENCE.

Both muscles and tendons may be injured from stretching forces, such as in an attempt to reduce a long standing dislocation. Wrenching of a limb caught in machinery may tear the muscles at some distance from the site of the external injury, and examples of rupture of the biceps humeri from this cause are to be found.[2] Avulsion of a tendon due to explosive violence at a point remote from the actual tear in the tendon is another example of rupture from indirect violence. Fig. 1 shows the flexor longus tendon of the index-finger torn away from muscle-fibres—i.e., at the musculo-tendinous junction—as the result of the explosion of a powder flask in the hand.

One of the best examples of rupture of a tendon by indirect violence is that of the insertion of the finger extensor into the base of the distal phalanx, mallet finger. Such an injury may result from a misjudged attempt to catch a hard ball, the impact being taken by the tip of the finger, which is held partially flexed and tense, incurved towards the palm. More trivial injuries, such as tucking in bedclothes, may be a cause in older people, and it is significant that the middle and longest finger is easily the most common one to be affected. Two varieties occur (Fig. 2)—namely, rupture of the tendon, and tearing-off of the prominence at the base of the phalanx into which the tendon is inserted (disinsertion).

There is a choice of treatment between splinting and operation, and good results are to be obtained by either method. The most convenient form of splint is that of Lewin. It is made of aluminium, and holds the distal joint in hyperextension. The splint should be worn for six weeks, and therein lies the disadvantage of the treatment, especially among hospital patients, for they are apt to weary of it, or to remove it at intervals to see how the finger is getting on. For this reason, I prefer operation. An incision is made along the lateral border of the finger extending from the first joint to a point midway between the second joint and the nail bed, and a second joins the distal end of this at right angles.

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* Based on a paper read before the British Orthopædic Association at Newcastle, on Oct. 31st, and representing a part of the Robert Jones Essay, 1930.

The injury is exposed by turning up the flap so formed, and the proximal end of the tendon is sutured to the periosteum at the base of the phalanx.

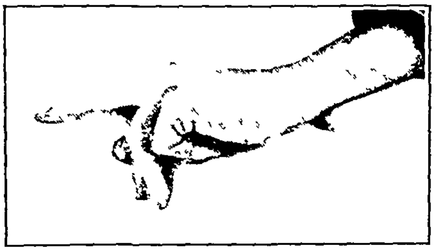
Fig. 3 shows the result obtained in a boy of 12 years. There is no disability. Fig. 4 is of a case of particular interest in that no less than 26 days intervened between the injury and the operation, during which there was no attempt at treatment. Both flexion and extension are slightly limited. The patient is a man of 48 years, who ruptured the tendon tucking in bedclothes. The deformity of the nail which follows operation is due to disturbance of the nail bed, and disappears in two to three months.

The baseball finger of American authors[3] is a similar injury, but in this case it is the extensor slip to the middle phalanx which breaks. The deformity is characteristic, with the proximal joint held in slight flexion, and the distal extended, but not hyper-extended. This injury may cause snapping or trigger finger. A woman, aged 50, felt a snapping sensation in the ring-finger of the left hand when carrying a coal-scuttle, and the finger has been weak since. Four years later I saw her on some other account. The ring-finger is held in the characteristic position described. It can be flexed up into the palm, but after remaining in flexion for some time after the other fingers are extended again, shoots involuntarily into extension with a snap. The condition is probably due to dislocation forwards of the two intact slips of the extensor, so that the head of the first phalanx is imprisoned between them, and on contraction of the extensor with the finger flexed the patient is unable to straighten it, but grips the head of the phalanx more tightly. The finger straightens out with a snap when both extensors and flexors are relaxed together.

MUSCULAR VIOLENCE.

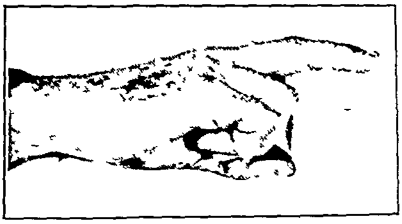
Strain of muscle is a common result of muscular violence. We may use the term to denote a painful minor injury to a muscle in which there is no evidence of gross rupture. The exact pathology of the condition is unknown, for there is no opportunity for detailed pathological investigation. In perhaps the majority of cases of strain of muscle, however, there is clinical evidence that the condition is due to rupture of a few fibres within the muscle substance. The physical signs are a localised area of deep tenderness and a temporary loss of power, either partial or complete. The tear in the muscle may be limited to intramuscular connective tissue, a small patch of hæmorrhage, or of œdema resulting.

FIG. 3.



Before accepting such a hypothesis in explanation of every case, attention is drawn to the condition of what might be called subacute strain of muscle that may follow violent exercise, especially if the muscle be unaccustomed to such exercise. After the first Rugby match of the season the leg muscles may become stiff and painful on movement. There may be generalised or localised tenderness to pressure over the muscle. The condition is, in fact, clinically identical with the acute strain of muscle, except that it is more widespread. It is probably due to an accumulation of an exudate between the muscle fibres resulting from delayed absorption of the products of excessive metabolism. I lean to the view, however, that the exudate is of traumatic origin. The attachments of the muscle-fibres to the fibrous tissue within the muscle is subjected to a long series of "insults" by the frequent and violent contraction of muscles unprepared by training for the exercise. That the condition is ultimately due to an exudate, whatever be its origin, is shown by the nature of the most effective treatment. If left alone the soreness wears off slowly. Heat and massage and exercises readily improve the condition by aiding absorption of the exudate. Exercises are of special importance, for the stiffness can often be worn off by a violent repetition of the exercises which gave rise to it originally, once the agony of the first ten minutes or so is over. A parallel condition of the tendons, clinically if not pathologically, is tenosynovitis resulting from excessive use.

FIG. 4.



The effect of an acute strain of muscle upon the rest of the muscle is of paramount importance from the standpoint of treatment. The refusal of the strained muscle to contract is due either to a temporary paralysis of the muscle, or, more probably, to reflex inhibition, as contraction is now painful. If left alone the muscle may progressively lose power, and the strain is likely to become chronic or recurrent. Furthermore, movement may be limited by adhesions or localised contraction of the muscle around the lesion within it, and it is this type of case which provides the bonesetter with the possibility of a dramatic cure by manipulation.

Muscle, like all tissues of the body, depends upon function for its well-being. It is unfortunate from the standpoint of the treatment that its function is that of contraction. In my opinion massage alone is powerless to prevent wasting of a muscle, or to restore a muscle already wasted. To rest an injured muscle ensures that a fibrous scar will form within it in due course, but at the expense of a wasted muscle. Moreover, the scar may become adherent to neighbouring muscles, or even to neighbouring muscle bundles, and, finally, œdema may persist within the muscle, similar to the œdema which so often persists in fractures of the leg before function is restored.

Active contraction may aggravate a partial tear of muscle—may even increase it. Therefore, if the tear be considerable, it is wise to operate and suture it, so that contraction of the muscle may be commenced sooner than would otherwise be possible. In minor injuries—strains—the harm that contraction does to the lesion is more than compensated for by its prevention of wasting and adhesions, and for this reason strains should be treated by exercises, aided by massage and heat. The harmful effect of the exercises upon the local lesion can be minimised by limiting excessive contraction by strapping.

There are a number of well-recognised conditions which come under the heading of strain, such as tennis elbow (one form at least), tennis leg, cricketer's thigh, and javelin thrower's arm, but I do not propose to describe them here.

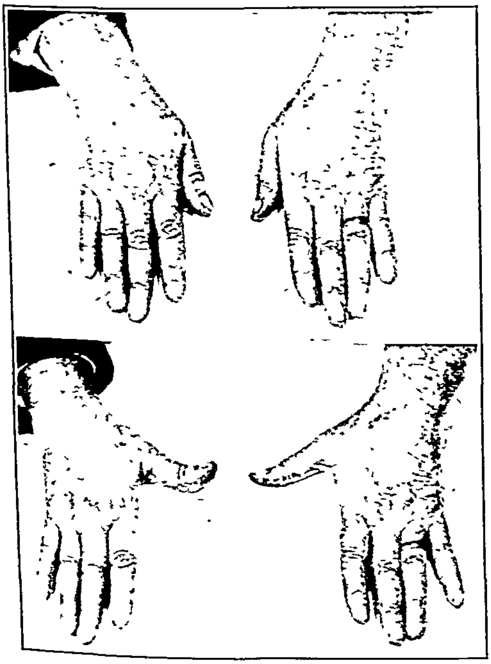
Complete rupture of a muscle or tendon from muscular injury alone is rare, there being only 15 cases out of a total of 18,950 surgical admissions into King's College Hospital. This figure perhaps exaggerates the rarity, as it is probable that a number of the cases seen in the out-patient department were not suited for admission. It has been pointed out that under normal conditions healthy muscle in a healthy subject should not be capable of inflicting injury upon itself. Predisposing causes must be looked for therefore in local conditions of the muscle and tendon, the general condition of the patient, and abnormal circumstances of contraction. Such factors may either diminish the threshold violence for rupture, or momentarily increase the contractile force of the muscle beyond its tensile strength.

LOCAL ABNORMALITIES OF MUSCLE AND TENDON.

Zenker's degeneration of enteric fever, which predisposes to rupture of the rectus abdominis, is well known. Ruptures of this muscle may also complicate severe influenza, as Abrahams and others [4] have shown. The degeneration of muscle in this disease is of a different type from Zenker's.

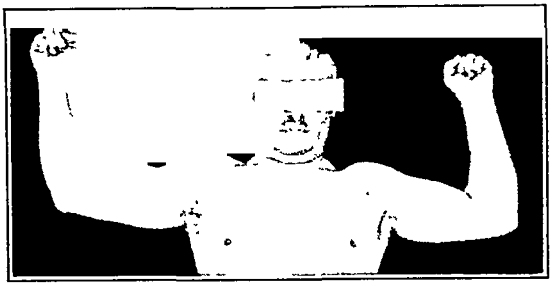
It is exceptional to find primary disease in a tendon predisposing to rupture. Melchior [5] describes a case of rupture of the finger extensors due to gonococcal tendovaginitis. In the museum of the Royal College of Surgeons of England there is a specimen showing gouty deposits within the long flexor to a finger near its insertion. It is conceivable that such deposits may give rise to necrosis, which will lead to rupture.

FIG. 6.



The most striking example of pathological rupture of a tendon is that of the long tendon of the biceps in arthritis. A man of 54 had attended King's College Hospital with painful arthritis of the right shoulder for 18 months. There was little to see in the radiogram. Three days before the photograph (Fig. 5) was taken a lump suddenly appeared in the arm without any sudden symptom suggesting rupture by violence. The lump is the belly of the biceps occupying a lower position in the arm following rupture of the long tendon. Meyer [6] has investigated the pathology of rupture of the long tendon of the biceps in dissecting no less than 13 specimens obtained post mortem. In these cases the disability is not great, and the distal portion gains reattachment to the humerus in the neighbourhood of the bicipital groove. No attempt at operative repair is advisable.

FIG. 5.



Rupture of the long tendon of the right biceps secondary to arthritis of the shoulder.

Previous injury may be a predisposing cause, the muscle or tendon being partially ruptured by this injury, the rupture being completed by a similar type of injury at a later date. In the case of tendons, the injury may cause degenerative changes which lead later to spontaneous rupture. The most striking example of this is rupture of the extensor pollicis longus after injury about the wrist-joint. The injury is usually a Colles fracture, but not invariably, for it may follow simple sprains of the joint. I am indebted to my colleague Mr. St.J. D. Buxton for permission to describe the following example.

A woman of 45 years sprained her wrist. Six weeks later she noticed that she could not extend her thumb. Operation showed a gap in the extensor longus tendon, bridged across by fibrous bands at the distal margin of the posterior annular ligament. Direct suture was possible, and a good result followed. Fig. 6 shows the condition two years later. Movement is perfect except that hyperextension to the degree possible by the right thumb is not present.

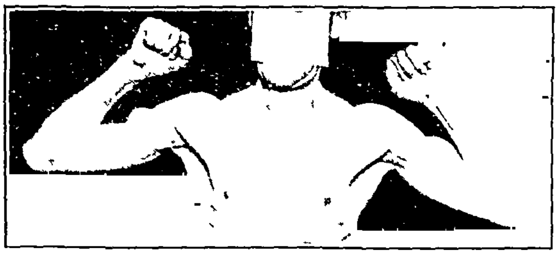
There is considerable microscopic evidence,[7] obtained at operation upon such cases, that the predisposing cause generated by the initial injury is a hyaline degeneration in the tendon, though it does not appear to have been proved whether such degeneration is the cause or the result of the complete rupture of the tendon. The break in extensor longus pollicis always occurs at or near the distal margin of the posterior annular ligament. This site of election is undoubtedly due to the abrupt change of direction of the tendon at this point when the wrist is dorsiflexed.

A history of previous injury is sometimes present in other ruptures, for example, the long head of the biceps, and Mr. H. A. T. Fairbank, who has kindly furnished me with the notes of several private cases of muscle rupture, permits me to mention the following example.

A man of 25 felt something go in the left arm when tackling a man at rugger. A bruise appeared to the outer side of the biceps. The arm got well, but showed some deformity.

Five weeks later the history repeated itself, and when seen three weeks afterwards it was obvious that the long tendon of the biceps had ruptured. At operation the long tendon was found curled up in a mass at the upper part of the fleshy belly, and was so firmly matted that no attempt was made to unravel it. It was sutured to the groove and adjacent tendons. The operation was completely successful and the patient, who had been an Olympic swimmer, was chosen to play water polo for his county four months later.

FIG. 7.



Apparent rupture of the tendon of insertion of the right biceps in a tabetic.

Finally, occupational strain may predispose to rupture, as instanced by the Trommlersehne—drummer's rupture—of German literature.[7] The rupture is of the extensor longus pollicis, at the site of election already described. Other muscles and their occupational predispositions, as stated by various authors, are as follows :—

Thigh adductors in swimmers and riders.
Rectus abdominis in cavalrymen.
External oblique in reapers.
Pronator radii teres in lanceplay (javelin thrower's arm, an example of which is included in the King's College Hospital series).
Pectoralis major in climbing. The one case of rupture of this muscle in my series was sustained by a boxer, who over-reached on driving a right-handed punch at his opponent, who eluded it. The rupture was a partial one.
Biceps in glass blowers.

The contention that the wearing of high heels predisposes to rupture of the tendo Achillis is not borne out by the sex-incidence of this injury.

GENERAL CONDITION OF THE PATIENT.

Like bones, muscles and tendons appear to be more susceptible to injury as age advances. When a man past the athletic age indulges in some violent form of exercise, such as running the hundred, he puts a severe strain upon the integrity of his muscles and tendons. With one exception, all the cases of rupture of the quadriceps in King's College Hospital were over 50.

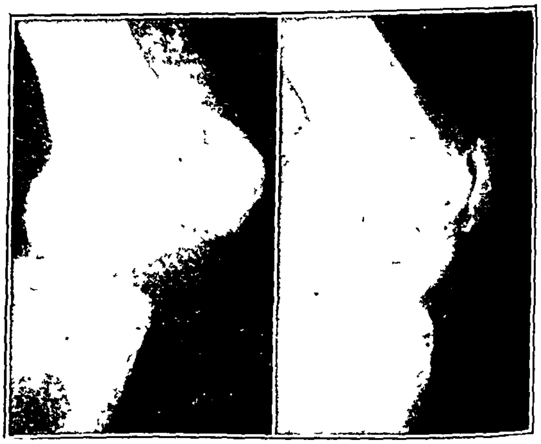
Many diseases are quoted as predisposing causes—arterio-sclerosis, rheumatism, typhoid, alcoholism,[8] and diabetes,[9] to mention a few, but there is lack of clinical evidence. Tabes dorsalis appears to affect tendons in the same little understood way that it does bones. Fig. 7 illustrates the case of a man of 50, who has been under treatment for four years for tabes.† He has been a boxer, hence his excellent physique. The lower tendon of the right biceps appears to have ruptured, but clinical examination shows it to be intact, but stretched. No scar can be felt. It gradually got like this, there having been no causal injury.

ABNORMAL CIRCUMSTANCES OF CONTRACTION.

How can we explain those cases of rupture of muscle and tendon in healthy subjects ? The rarity of muscle rupture, even in the violent contractions of tetanus, supports the view I have already p forward, that healthy muscle in a healthy subj does not rupture from muscular violence alo Some abnormal circumstance of contraction mu be present, and this is usually created by the eleme of surprise, or fear, which may cause a brisk co traction of the muscle, which is entirely unconscio and involuntary. The surprise element may te porarily inhibit control, and the intensity of t contraction may be of itself sufficient to cause ruptu Such a surprise contraction may occur to preve falling. The usual mechanism of rupture of t quadriceps is an example of this. A man comi downstairs slips as he placed his left, say, heel the step in front. In order to prevent himself falli backwards, he involuntarily contracts the quadrice of the leg behind (the right) to the full extent of i power, and this contraction, coupled with the weig of the falling body upon the bent right knee, resu in rupture of the right quadriceps.

Each deliberate body movement is carried out a synergic group of muscles. If, because of fe or surprise, one muscle involuntarily attempts execute a movement ordained to be carried out the group of which it is a synergic member, it ma prove too feeble and break. Again, during forcef contraction of a muscle, or muscle group, to achie some object, a sudden emergency situation ma *arise which causes the antagonists to contract* brisk and involuntarily. This prevents the moveme first started, and the muscle may rupture. Th mechanism of contraction may be at fault. A musc which normally acts *from its origin may* sudden be called upon to reverse its action. The profession gardener is maintained in a stooping attitude throug out the working day by contraction of the rec abdominis, acting from the origin. He may ruptu these muscles if he suddenly calls upon them reverse *their action, as, say, in vaulting into* th saddle. Lack of habit is another factor. Recruit suffer injuries to muscles from comparatively trivia causes, which leave the trained soldier unscathed It is well recognised by the management of profes sional football teams that it is an economy to spar no expense in the training of their teams, as th sick list from injury is thereby immeasurably reduced

FIG. 8.



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Rupture of quadriceps. Appearance before and four years after operation.

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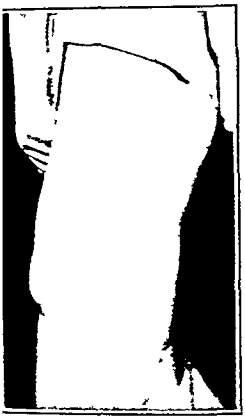
† I am indebted for this case to Dr. Macdonald Critchley.

he following illuminating sentence of Ombredanne[1] an excellent summary of this aspect :—

> "Somme tout, manque d'habitude de l'individu et anque d'habitude du muscle pour produire un mouvement inaccoutumé sont les causes premières de cette contraction anormale, incoordonée. déreglée, exagerée, qui aboutit à la rupture."

FIG. 9.



These explanations cannot be applied perhaps to all cases. and at best only touch upon a very complicated and elusive subject. A study of the mechanism of muscle rupture will, however, show that the element of surprise is usually a prominent feature.

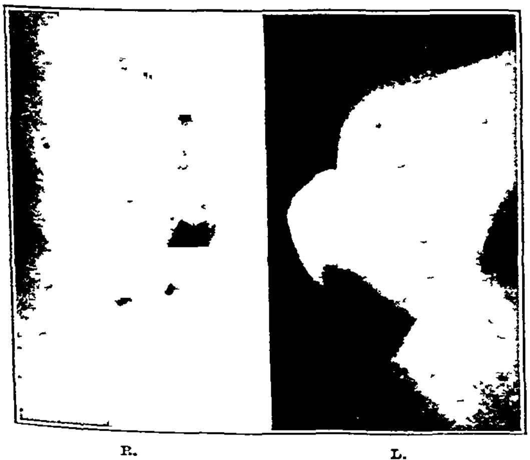
RUPTURES OF SPECIAL MUSCLES.

The commonest ruptures are of the rectus femoris, the biceps humeri, and the tendo Achillis.

The *rectus femoris* has two sites of election : a high one at the junction of the muscle-fibres with the tendon of insertion, and a low one at its insertion into the patella. In the latter injury the lateral expansions might also be involved to a varying extent. The low rupture is the more serious lesion and always demands operation. Not infrequently the torn muscle carries away with it a small fragment from the upper margin of the patella, and this is all to the good, as it makes suture easier.

Fig. 8 shows an example of this injury in a man of 51, who slipped on a wet floor. The right leg went forwards, and the left quadriceps contracted to prevent falling. The left foothold also gave, and the foot slid backwards until it was arrested by coming into contact with a wall, and the rectus ruptured at its attachment to the patella, taking away a flake of bone. There was an interval of two months between the accident and operation. Four years later a small gap could still be seen between the small fragment of bone and the patella. but the functional result is excellent.

FIG. 10.

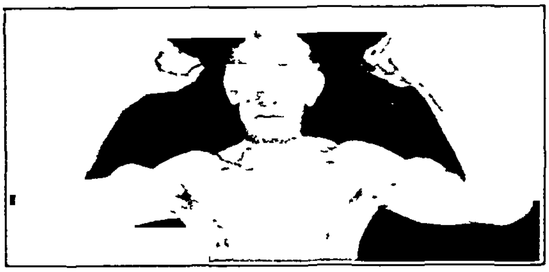


Rupture of the right infrapatella and tendon five years after operation. Note the difference in level as compared with the uninjured side (L.)

Operation is advisable in recent cases of rupture of the rectus femoris at the musculo-tendinous junction, but is not essential, and in late cases should certainly be left, for the rest of the quadriceps compensates for any loss of power, and there is very little disability. Operation in late cases is not easy because of the difficulty in obtaining a suture hold in the muscular (proximal) portion. I should deprecate any attempt to restore the muscle by placing a fascial graft in the gap in late cases, for the muscle will have undergone shortening.

Fig. 9 shows this type of rupture in a man of 20, who ran up against a heavy opponent at rugger. He tried to bend the knee and felt something give. He has a somewhat confused memory of the accident, and the exact mechanism of the rupture is not clear. The illustration was made five months after the accident. It is now 18 months since the rupture, and the function of the leg is good, the patient playing rugger regularly without any appreciable handicap.

FIG. 11.



Rupture of the tendon of insertion of the biceps. Appearance two years after operation.

Infra-patellar tendon rupture is a rare injury and calls for early operation, which may be a matter of considerable difficulty, as the tendon usually ruptures near the bone. Gallie[10] recommends a reconstruction operation, using a slip from the tendo Achillis tendon, and has secured good results by his method in both early and late cases.

The case illustrated (Fig. 10) was that of a man of 52, who fell out of a trap and hyperflexed the right knee. At operation it was found possible to suture the tendon directly, and the result five years after operation is shown. Movements are full, but the muscles are weak and tire easily. The patella is higher on the affected side by ⅝ths of an inch. This is due to stretching of the scar, in which some ossification has taken place.

The poor result obtained in this case is an argument in favour of the routine use of Gallie's operation for rupture of the infra-patellar tendon.

The *biceps* may rupture in any part of its course, and cases have been reported of rupture of the long tendon above the bicipital groove, in the groove, at the musculo-tendinous junction. through the belly, and of the tendon of insertion. Rupture of the short head may also occur. With the exception perhaps of the last named, operation is indicated in all cases in which there are no local predisposing causes. such as arthritis of the joint, but care must be taken in giving a prognosis in rupture of the long tendon cases who are unsuited to, or refuse operation, for the short head of the biceps is capable of considerable compensatory hypertrophy, and the resulting loss of function may ultimately be very slight.

Fig. 11 illustrates a case of rupture of the lower tendon of the biceps two years after operation. The patient is a man of 50, and was lifting a relative, who was having a fit, on to a couch. The body lay across his forearms held in full supination. As he lifted his burden. it suddenly started to slip, and he gave a sudden and involuntary lift up with the right arm and felt something give. At operation three days later the lower tendon of the biceps was found retracted and coiled up. having ruptured near its insertion into the radius. The proximal end was sutured to the supinator brevis fascia. As is evident from the illustration, the scar has stretched, but function is good. He can carry heavy weights with the arm, and his only complaint is that he cannot use a walking stick.

Rupture of the *tendo Achillis* appears to be most common where the muscle-fibres end, which is the narrowest portion, and about 1¾ in. above the os calcis. The plantaris may rupture with it. It is surprising how trivial may be the cause of rupture of the tendo Achillis in older subjects. A man of 63 felt something give at the back of the right leg when stepping off a low curb, and a violent pain in the calf, as though struck from behind with a stick. Operation showed a complete tear of the tendon. The optimum treatment in all cases of complete rupture of this tendon is undoubtedly operation, and the case for conservative treatment is largely a relic of pre-Listerian days.

Partial rupture of the *gastrocnemius* is the usual form of tennis leg, and should be treated on the lines already suggested for minor injuries. The at-one-time popular theory that tennis leg is due to rupture of the plantaris tendon can, I think, be completely discredited, in view of the absence of any shred of evidence, either clinical or pathological, in support of it.

Riders' rupture—rupture of the *adductor longus*—varies from a tearing of a few fibres to complete rupture of the muscle at its insertion into the femur. Occasionally the adductor brevis ruptures, but rupture of the adductor magnus is rare. Operation should not be attempted even in complete ruptures of the adductor longus, as the break occurs so close to the bone that repair is practically impossible. Very little disability results from the injury, although excision of the muscle tumour caused by the loss of its insertion may be necessary at a later date.

Rupture of the *hamstrings* is rare, but through the courtesy of Mr. Fairbank I am able to describe the following case of complete rupture of the semi-membranosus in a man of 20.

> There was a double injury at an interval of three years, both sustained at Rugby football. On the second occasion the patient was tackled by the left ankle, and felt something go above the left knee. At operation five weeks later, a scar was found in the semi-membranosus, with the healthy muscle belly below. Above the scar there were some pale, paralysed fibres, and above this again a short portion of healthy muscle. The scar was freed, divided, overlapped, and sutured. The belly of the muscle was sutured to the healthy fibres above. Ten months after operation the patient reported that he was playing Rugby again without any disability.

Ruptures of the *rectus abdominis*, apart from disease, are of particular interest because in a few cases operation has been performed on a diagnosis of acute appendicitis. The lesion in the muscle is usually a tear near its origin from the pubis. There is pain and tenderness to pressure, with local resistance and a tendency to nausea. The rupture occurs as the result of some sudden strain referred to the abdomen. Behan[11] describes the case of a patient who suffered this injury from opening a window with a jerk.

Mention must be made of muscle and tendon lesions around the shoulder-joint, which may be a cause of persistent shoulder pain after injury. The *supraspinatus* tendon appears to be the most frequently injured. Codman[12] states that he has no difficulty in finding a complete or partial tear of this tendon in the dissecting-room, and puts the incidence at 1 in 20 of the bodies dissected. This is certainly much higher than the clinical evidence in this country leads us to believe. Injury of the tendon is related to subdeltoid bursitis, and the physical sign of crepitus may be elicited. The two cases which I have seen of subdeltoid bursitis following injury, one in a rheumatic subject of 43 and one in a healthy girl of 22, both got well with physical treatment. In neither of these cases was there any X ray evidence of the presence of calcareous deposits about the tendon that sometimes complicates the injury.

Open Wounds of Tendons.

I shall confine my remarks to open wounds of the finger tendons, a subject which I conceive to be of very great economic importance. Table I. indicates the relative frequency of open divisions of the extensors and flexors of the fingers.

TABLE I.

—	Wrist.	Dorsum.	Thumb.	Fingers.	Total.
Extensors	10	13	2	27	52
Flexors ..	25 8 unaccompanied by nerve injury.	Palm. 11	4	11	51
			Total ..	..	103

Taken as a whole, wounds of the extensors do well after suture, but wounds of the flexors badly. How badly is shown by the figures in Table II.

TABLE II.—*Results in 34 Cases of Cut Flexor Tendons.*

—	No.	Good.	Fair.	Bad.	Untraced.
Wrist	8	4	2	2	0
Palm	11	2	2	7	0
Fingers	11	0	0	5	6
Thumb	4	0	2	2	0
Total ..	34	6	6	16	6

Out of 28 cases traced, therefore, the results are as follows: good, 21 per cent.; fair, 21 per cent.; bad, 58 per cent.

This summary of results agrees in the main with other authentic statistics.[13] The difference in prognosis between the extensors and flexors is due to the presence around the latter of a synovial sheath with its delicate gliding mechanism. The cause of the failure in all cases was the formation of adhesions in and about this sheath, so that the tendon was anchored. If one knew how to prevent adhesions, good results could be obtained. What are the predisposing causes of their formation? I think they may be summed up as sepsis, bad operative technique and prolonged immobilisation.

Sepsis.—Our control over sepsis is a limited one yet much can be done to counter infection. Many of the cases included in Table II. were sutured in a casualty department immediately, under the mistaken view that urgency is essential. Such is not the case. The only two perfect results of division of the flexors in the palm were both sutured in the operating theatre three days after the injury, and after careful preparation of the skin. To minimise sepsis, therefore, operation should not be regarded as an emergency measure, but should be performed under ideal conditions after routine preparation of the skin.

Bad Technique.—The operation is not one really suited to resident hospital officers, but calls for experienced work. The actual method of suture is of extreme importance, the aim being to obtain as small a scar as possible. The method of "buried suture" suggested by Bunnell[14] is probably the best, the knots of the suture being brought to lie between the divided ends of the tendon.

Prolonged Immobilisation.—If accurate suture is achieved, there should be nothing to fear from early movement, which may be commenced the next day. The movement must be active or assisted, for passive movements alone have absolutely no power to prevent adhesions. A splint must be worn except during treatment to prevent the tendency to flexion deformity, which is apt to occur. Finally, apart from the prevention of adhesions, movement is important in that by its means correct orientation of the scar in the tendon may be obtained from the outset.

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THE MECHANISM OF DIASTOLIC BLOOD PRESSURE.

A NEW CONCEPTION.

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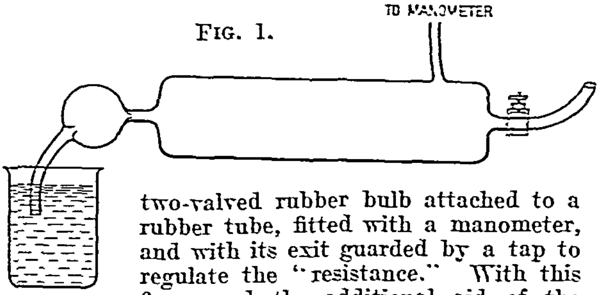
I PRESUME that the apparent simplicity of the conventional theory of the production of diastolic pressure, and the lack of any obvious alternative, is the reason for its appearance without material alteration in successive generations of physiological text-books ever since diastolic pressure became an accepted clinical fact. But anyone who, like myself, studies the literature of the subject, cannot avoid being impressed by the fact that physiologists, in assuming its accuracy, have frequently had great difficulty in satisfactorily accounting for circulatory phenomena. Their explanations have, indeed, been ambiguous and confusing. The purpose of this paper is to demonstrate that there may be another, and almost equally simple mechanism, which can account for all the associated clinical facts, and suggest solutions of problems which the other cannot solve.

The hydrodynamics of the circulation being a vast and intricate subject, I must try to set out my views as briefly and simply as possible, the facts on which they are based being more fully set forth, although differently interpreted, in the standard physiological text-books. Unfortunately these books only describe the mechanism of the circulation as it is believed to function in the fully developed adult anatomical "unit." For instance, the statement is made that the heart is a prime cause of blood pressure; whereas it is patent that pressure exists in the earliest embryonic days before the heart is formed. Embryological works are likewise disconcertingly silent or vague on the manner in which blood-vessels develop during the first few days after fertilisation of the ovum. So far as I am able to conceive of the sequence of pressure development, from the birth of the circulation, it leads me to an impasse if I accept the customary view, but easily fits in with the idea I am about to expound. For instance, how does the pressure start from zero and finally stabilise at the normal terminal diastolic pressure? But perhaps it were fitter that I should do no more than hint at the profound readjustment of orthodox views necessary should my theory be valid, and without further generalisations proceed to develop my argument.

Fig. 1 shows a piece of apparatus consisting of a two-valved rubber bulb attached to a rubber tube, fitted with a manometer, and with its exit guarded by a tap to regulate the "resistance." With this figure and the additional aid of the graph, Fig. 2, I can demonstrate most of the points I wish to make clear.

FIG. 1.



THE CONVENTIONAL THEORY.

In the first place, for the sake of comparison, let us consider very briefly the mechanism of the conventional theory.

Fill the apparatus with water so that it is just about to escape from the up-tilted nozzle tip, and the intratubal pressure will be slightly above zero. For practical purposes, however, we may call it zero. We will assume that the capacity of the bulb is 65 c.cm., and that owing to the size and resiliency of the tube, and adjustment of the tap, if we empty the bulb by squeezing it in 0·3 sec., the manometer will show a rise of pressure to 50 mm. Hg. If the tube is then allowed to discharge its excess volume until zero pressure is reached, and the status quo ante is attained, the time required from the termination of the bulb compression to this point will be, say, 2 secs. ("diastolic period"). But at the expiration of 0·5 sec. the pressure will only have fallen to say, 30 mm. Hg. A total period of 0·8 sec. having therefore by now elapsed since we began to squeeze the bulb, we repeat this procedure, but owing to the additional volume and pressure in the tube we shall require extra force to overcome the resistance in 0·3 sec., and at the expiration of a further 0·5 sec. the pressure will be higher than at the end of the first "cycle," although the water has been escaping at a faster rate. After an indefinite number of these 0·8 sec. cycles, equilibrium is supposed to be established, and the intratubal pressure can be imagined to have been stabilised as we find it actually to exist in the human circulation and depicted on the graph (Fig. 2, NSEFMN).

OBJECTIONS TO THE CONVENTIONAL THEORY.

At this point I think it would be well that I should briefly indicate some of the more obvious objections suggested by this mechanism.

1. It is difficult to conceive how analogous conditions could obtain in the real circulation, during its birth.

2. It is pure assumption that the arteries really are distended at the end of diastole, their calibre at zero pressure never having been measured.

3. It is implied that the arteries are always distended by a pressure of at least 80 mm. Hg throughout life. This entails constant histological distortion of the walls, which by analogy with other vital tissues should result in structural change of a permanent and injurious character. Physiological activity requires proportionate rest.

4. A great part of the heart's energy is absorbed in overcoming the already partly distended arteries. If

it can be shown that it is possible to have the same clinical pressure readings, even if the vessels are completely relaxed at the end of diastole, so far as their elasticity is concerned, it would support the view that in this case also the conventional idea is unphysiological and unsound.

5. In order to maintain the minimum pressure at the same level at the beginning and end of the cardiac cycle, and also to keep the diastolic pressure within safe limits, very delicate adjustments have to be made between the resistance and the heart-beats, as can be shown by our apparatus. The blood enters the aorta through a sectional area of say, 7 sq. cm., and leaves the systemic arterial portion, through about 9000 millions of arterioles, of a combined sectional area of about 9500 sq. cm. These minute vessels are divided up into numerous groups of varying functional activity—e.g., renal, hepatic, muscular. Physiologists admit that local isolated groups influence the pressure but slightly, if at all. Therefore it is implied that the greater part of all these groups can so coördinate their various functions as to either *permit of a steady heart-rate, or an abnormal one,* without disturbing the pressure. If another factor can be shown to do this in a more practical way this will also help my argument.

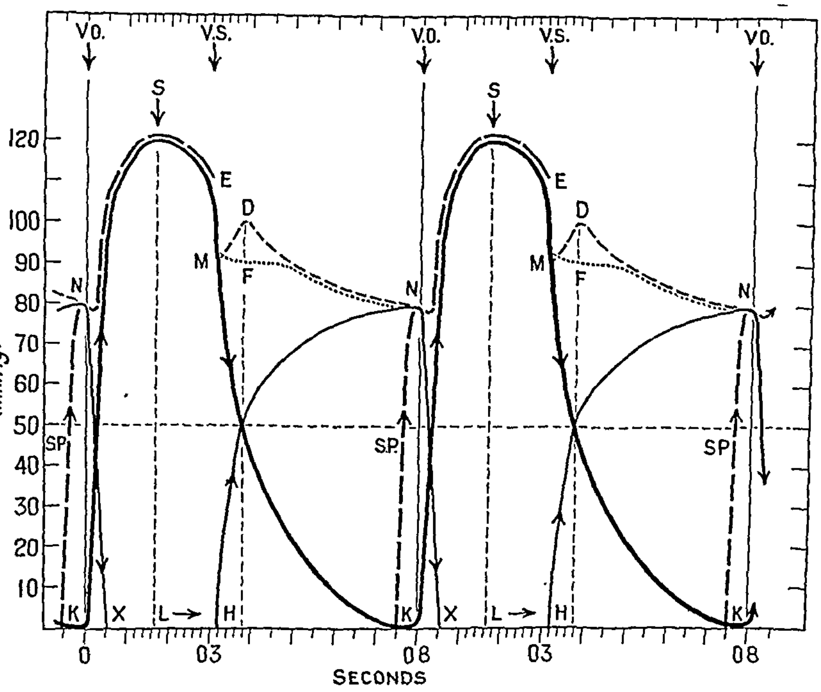
6. The whole burden of propelling the blood during diastole is thrown upon the arterial elasticity under the usual scheme. The internal surface area of the arterial vessels alone has been computed at about 30 sq. metres. It is also estimated that these number about 17,000 millions, of various sizes and tortuosity, and hydrostatic elevation. In addition there is the hydrostatic "head" to be overcome at the arteriolar-capillary junction, representing the "resistance" of the capillaries and veins beyond this. It is immaterial whether the above figures are only approximately correct; surely it might reasonably be expected that a constantly falling "store" of elastic energy would be inadequate for this task, and would be better performed by an active muscular force, as I will suggest. It is useful to recall that the heart, with about 65 beats, passes into the arteries all the blood in the body.

7. The only interpretation—viz., reflux effect—it permits of the dicrotic wave is extremely unsatisfactory (see later). Whereas if the phenomenon be regarded as the signal of the onset of muscular contraction (see graph), this would be strong corroboration of the correctness of my *alternative theory.*

DIFFERENT MECHANISM.

For present purposes this selection of (admittedly controversial) objections must suffice.

FIG 2.



Graph depicting two successive normal heart cycles (0·8 sec.). The upper composite line, NSEMDN, corresponds to normal intra-arterial pressure.
Thick interrupted line, SPNSE = ventricular systolic pressure, reaching maximum at S and ending E. Portion SP = presphygmic rise, which does not affect intra-arterial pressure, merely serving to force valves open at N. V.O. = opening of valves. V.S. = closing of valves.
Thick continuous line = elastic pressure due to varying volume of blood. Portion K (zero) to E = while ventricle is acting. E to M = immediately after valves close. M down to K = curve resulting from added *arterial muscular compression, accelerating* evacuation.
Fine dotted line, MFN = course which would be taken by thick line if no muscular compression was acting.
Thin continuous line = pressure on arterial contents due to muscular coat, starting at H (zero) after latent period L→H, rising to N, where it serves to hold valves closed while SP is rising. Then dropping sharply to X (zero).
Thin interrupted line, MDN = resultant pressure curve of added muscular and elastic effects. D = dicrotic wave. M = incisura.
Note that the vertical line dropped from D intersects elastic curve at 50 mm. Hg, and the muscular at 50 mm. Hg, the total forces acting on arterial contents at this moment being 100 mm. Hg.

Let us now return to our rubber apparatus, the tube of which we will imagine to be of a rather less resiliency than in our first experiment, so that when the same volume as before is injected the pressure will rise to 120 mm. Hg exactly as shown on the graph; falling to 90 mm. at the expiration of 0·3 sec., when the injection ends and the valve closes. *At this point* I am prepared to admit that a very *slight* pressure notch might occur in the real artery owing to the reflux, but the *analogy between the conditions in a rigid tube and an elastic* one, as usually given in the *text-books, is in my humble* opinion misleading. A rigid tube cannot take up the vacuum formed between the tap and receding column of water when the former is turned off, hence the column tends to move back, whereas an elastic tube can at once recoil on the vacuum and so prevent return of water. I shall therefore assume that the falling pressure gradient from here to the end of the 0·5 sec. diastole will not take the form of the dicrotic wave, but follow the line MFN (Fig. 2) just below, until it has fallen to 80 mm. Hg at the end of the cycle. If the bulb were to contract then, the pressure would, of course, rise much higher in the ensuing cycle, if we assume that the sole cause of the diastolic pressure is due to the elastic recoil. Supposing, however, that at the end of "systole" (V.S.) I grasp the *tube* in my other hand and squeeze it with a gradually increasing force, represented in time and degree by the uprising gradient (HN). This force aiding the elastic tension will cause the fluid to be evacuated at a rate and time indicated by the line (MK), with the result that when the end of the "cycle" is reached the "compressional" pressure has risen to 80 mm., but the elastic fallen to zero, and so the artery regained its normal calibre. This cycle can be repeated indefinitely without change. Thus while the "intravascular" pressure has followed the same course as before, its *components* have changed, and the calibre of the artery diminishes faster than under the conventional theory.

Now if it be possible that the muscular coat can act like my fist, the whole scheme becomes feasible in the living circulation. We can assume that at the moment the ventriculo-arterial valves are about to open the arterial pressure is at 80 mm. Hg, not because of elastic tension, but owing to muscular compression, and that as soon as the ventricular pressure has superseded this the arterial muscular contraction rapidly relaxes to zero. This can be effected in our rubber model by retaining the squeeze on the tube with our right hand until the bulb compression is started with our left. This muscular relaxation permits of the *undistended* artery being equally rapidly refilled. The effect is shown in the graph. The ventricle thus injects its contents under the best possible conditions. The slight fall at the beginning of the normal pressure curve (N) may be due to this.

The muscular force starting at H, after a period of rest from X, commences to act on the pressure curve MF at M, and it will be seen that the former rises in about 4/50 sec. to 50 mm. Hg, while owing to the increased rate at which the fluid has escaped during this time, the elastic curve MK has fallen 40 mm. from 90 mm. to 50 mm. Hg. Therefore, as 50+50=100 mm., the original line MF has risen 10 mm. to form the dicrotic wave (D).

When the tube is grasped as described, a bulge will form against the edge of the fist, and if this be slid along the tube, while compressing it, the bulge will advance ahead of it. If an increasing band of muscular contraction were to advance from the root of the aorta towards the periphery a similar bulge or wave would arise and show on a volume tracing like a dicrotic wave. It is obvious that if the artery is in active muscular contraction during cardiac diastole any risk of over-distension is impossible. As the growth of the muscular coat in the embryo would proceed pari passu with the development of peripheral resistance, there is no need to assume terminal diastolic arterial distension at any period of life; hence there is no need to think that arteries are more immune than other tissues to injury from histological distortion.

The usual stimulus to contraction of the involuntary coats of hollow viscera is stretching. The circulatory system is a hollow viscus. It is suitably stretched at each ventricular systole. Assuming it responds by contracting to this, it would do so in proportion to the force of the stimulus and its own irritability. A consideration of this possibility leads one to think that this is a more useful and practical way of controlling pressure than modifications of the arteriolar exit. It also opens up new therapeutic avenues.

GENERAL CONSIDERATIONS.

Is there any experimental evidence that arteries act in this manner? Although for many years I had conceived that this might be possible, it was only about two years ago that I came across a paper published by L. E. Bayliss nearly 30 years ago (*Jour. Phys.*, 1902, xxviii., 231), entitled The Local Reactions of the Arterial Wall to Changes of Internal Pressure. In this he says:—

> "The muscular coats of arteries react like smooth muscle in other situations to a stretching force by contraction . . . this force is myogenic in origin, as this result can be obtained in situ and in excised portions of the arteries. . . . When pressure is suddenly increased the artery appears to wriggle like a worm."

The experiments were performed on dogs' carotids. Those interested should refer to the full text. This seems to indicate that my views are not fantastic.

The latent period of smooth muscle is notoriously slow. The available period on our graph is from the summit of the systole curve to the point where the dicrotic wave starts—viz., nearly 0·2 sec.—which appears to be regarded as the minimum possible for smooth muscle in other localities. The arterial muscle is not quite comparable to, say, intestinal muscle; in certain areas, especially in the large vessels, it approaches the cardiac muscle in type, and possibly the latent period is shorter than imagined. I am not aware of any recent work on the excitability of arterial muscle which necessarily negatives my assumption that the available latent period is sufficient. Further there is some doubt in my mind whether the stimulus should not be regarded as commencing before the systolic summit is reached, and if so the period would be extended. Histologists inform us that the relative amount of muscular tissue in the arterial walls gradually increases towards the peripheral vessels in contrast to the elastic. This should be expected if the stored ventricular energy becomes less effective as the distance from the heart increases and requires muscular reinforcement in the manner I am suggesting.

The dicrotic wave is most marked in the medium-sized arteries, where the muscular action would be most evident and least in the elastic aorta where one would expect a valvular reflux wave to be most marked. Schiff's rhythmic pressure "rises" could be explained as a periodical elevation of the threshold of arterial excitability, although the cause of this periodicity remains uncertain.

The scheme allows for complete elastic relaxation once per cycle, rest for the musculosa during the cardiac systole, and conservation of cardiac energy and histological structure. In view of all the foregoing is it reasonable to assign to the arterial muscular coats no other function but that of maintaining that nebulous state called "tonus"?

When I was a student the idea of active capillary contraction would have been absurd. Veins were, and are still, regarded by clinicians as mere fibrous conduits, although anyone in the habit of injecting varicose veins knows how irritating the active contractile response to the needle can be. Hence the gods may have been caught napping once more; and my view that we must consider the existence of a new and even more important circulatory propelling force than the heart may not be so preposterous as might appear at first sight.

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KING EDWARD'S HOSPITAL FUND FOR LONDON.—King Edward's Hospital Fund for London has received a gift of £10,000 from an anonymous donor, subject to special trusts to be exercised by the King's Fund in their discretion, and under certain conditions, which will be communicated in due course to the hospital or hospitals concerned.

ACUTE RHEUMATISM AND THE SEDIMENTATION RATE.

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THE sedimentation rate of the red blood corpuscles varies with the health of the subject. It is no more specific of any disease than is a raised temperature; and, like variations in temperature, it can indicate both the presence of disease and the progress of an illness. The following preliminary note shows how the sedimentation rate changes with the varied progress of acute rheumatism in children.

TECHNIQUE.

In most of the methods for performing this test the quantity of blood required necessitates venous puncture; but as children do not tolerate repeated venous puncture at all well, a simple method was devised requiring only 0·4 c.cm. of blood which can easily be obtained, after a little practice, from one stab of the finger pulp.

The apparatus required is a pipette graduated at 0·1 and 0·5 c.cm.—an ordinary straight 1 c.cm. pipette graduated in 0·01 c.cm. is quite suitable—a small glass capsule or test-tube, a block of wood with a lump of plasticene stuck firmly on it, and finally some thin glass capillary tubing with an internal bore of between 1·6 and 1·9 mm. This is cut into lengths of about 12 cm. and a mark is made exactly 10 cm. from one end.

A solution of 3·8 per cent. neutral sodium citrate in water is the only reagent needed. 0·1 c.cm. of this solution is sucked into the graduated pipette and the finger is then stabbed, the blood is collected straight into the pipette by capillary action until full to the 0·5 c.cm. mark. The citrate and blood are then discharged into the glass capsule, mixed and sucked up into the pipette again. One of the capillary tubes is now stuck horizontally on the plasticene and the blood is run into it up to the 10 cm. mark. Still keeping horizontal the tube is pushed into the lump of plasticene which thus seals the lower end of the tube and without withdrawing the tube from the plasticene it is rotated into the vertical position and the time noted. The level of the blood is now above the 10 cm. mark owing to the plug of plasticene pushing it up. After standing it will be seen that the red cells have fallen leaving a clear column of plasma. The height of this clear column is measured in mm. after one hour and if desired again at 2 and 24 hours. The first hour measurement gives sufficient information, but in severe cases the reading at the end of half an hour is instructive. The reading at one hour is normally from 3 to 6 mm. and values over 10 mm. can be considered abnormal.

The following precautions must be observed:—

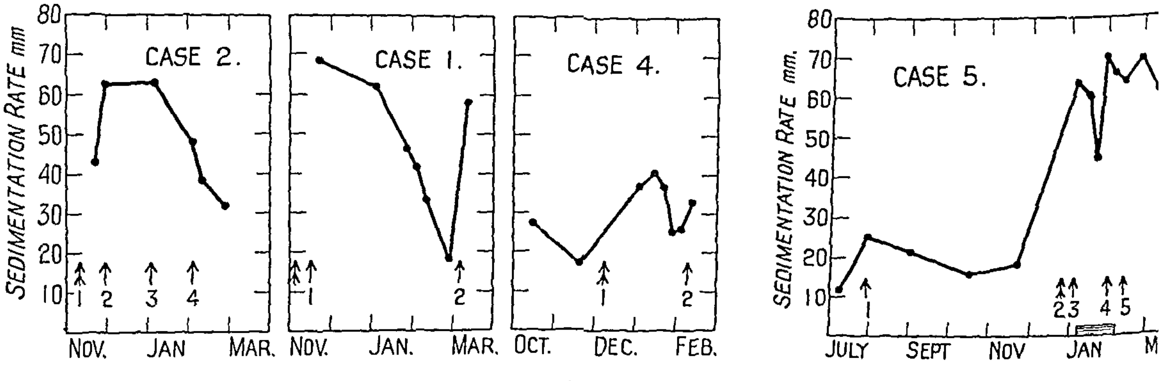
Temperature.—The optimum temperature is about 18° C., the rate of sedimentation increases with rise of temperature but only slowly up to 25° C., after which a more rapid rate of increase begins. It is sufficient to keep the tubes standing away from sources of heat and in summer to place them in a shady cool con of the room.

Position.—The tubes must be kept vertical af setting up. If it is necessary to transport the blo it is well to do so in a small stoppered tube af mixing with citrate and to put it into the capill tube later. This will not alter the result provid the delay does not exceed five to six hours.

Glassware.—The collecting pipettes should cleaned in the same manner as a blood count pipet the capillary tubes cannot be satisfactorily clea and are discarded. It is important to avoid dust grease as these are liable to cause air bubbles in capillary tube which must be got rid of.

RATIONALE.

While the variations in viscosity and spec gravity of the plasma have some small effect, two most important factors involved are the num of red cells and the protein content of the plas Anæmia will cause an increased rate of sedimentati as can be shown by diluting the blood with its o plasma; but given a normal number of red c the plasma is the controlling factor. The sa washed red cells will sediment rapidly in plas obtained from a diseased person and normally normal plasma, providing no agglutination occ from incompatibility. The rate of sedimentation i suspension such as red cells in blood depends larg on the size of the particles involved—e.g., mist a rain—and anything that causes the red cells agglutinate and form larger units increases the r of sedimentation. Broadly speaking, anything t allows the red cells to lose their electric charge allow them to agglutinate. The plasma fibrinogen a to a lesser extent the plasma globulin are both prote which tend to allow the red cells to discharge th electricity but the plasma albumin acts in an oppos manner. An increase in the fibrinogen or a decre in the albumin-globulin ratio will therefore tend increase the sedimentation rate and one or both these changes are usually found in practice when sedimentation rate is increased. It is probable t the site of these changes is in the liver, which is t sole source of fibrinogen and probably the m source of the other plasma proteins and also of t circulating antibodies which are linked with t euglobulin fraction of the plasma.



RESULTS.

Dr. W. Sheldon and Dr. W. R. F. Collis ha recently reported[1] an epidemic of tonsillitis in group of children convalescing from rheumatic fev It so happened that a series of sedimentation te were being made at the hospital at that time and t opportunity was taken to follow up some of the cases infected. The following cases, illustrated in the Charts, are selected from the series showing the results obtained. The arrows represent points of clinical interest (usually febrile disturbances). The double-headed arrows represent the "initial fever" in Sheldon's table. The shaded area represents the periods during which aspirin was given.

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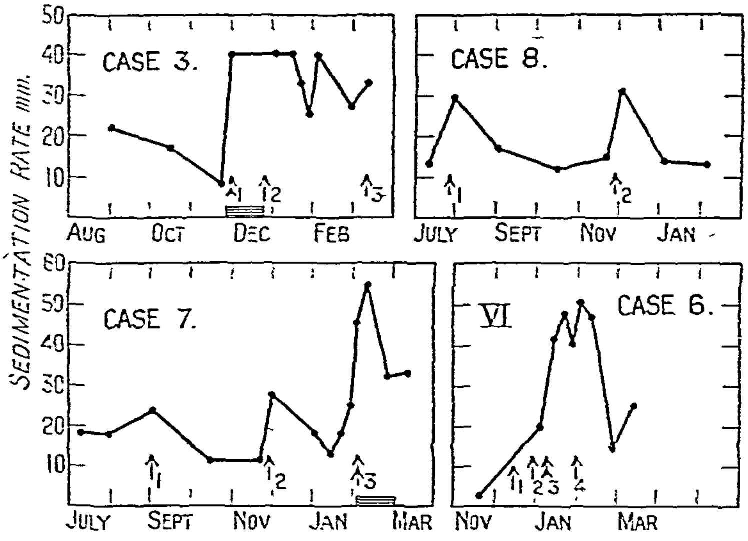
[1] THE LANCET, 1931, i., 1337 and 1341.



CASE 1 (Sheldon's Case 19).—Period 0–1: sore-throat, Oct. 11th, 1930; tonsillitis, Nov. 1st, and fluctuating temperature. Point 1: pericarditis. Period 1–2: progress steady; pulse-rate falling. Point 2: temp. 101° F.: pulse-rate rising: throat red; bronchitis.

CASE 2 (Sheldon's Case 20).—Point 1: tonsillitis: temp. 101° F.: pulse-rate raised. Period 1–2: quiescent; pulse lower: temp. normal. Point 2: relapse; temp. 101°: pulse-rate raised. Period 2–3: two attacks of fever with lung involvement. Period 3–4: no further attacks, but occasional slight rise of temp.; pulse-rate falling. Period 4 onwards: slow improvement.

CASE 3 (Sheldon's Case 23).—Point 0–1: doing well: *temp. normal*: pulse-rate becoming steadier. At 1: sore-throat; aspirin grs. x. t.d.s.: temp. 102°: pulse-rate raised. Period 1–2: temp. normal; pulse-rate as in period 0–1. Point 2: aspirin omitted: pulse-rate rose: nodules developed; no carditis. Period 2–3 onwards; pulse-rate more rapid than in period 0–1 but steady progress made. Point 3: slight pyrexia.

CASE 4 (Sheldon's Case 26).—Period 0–1: steady improvement; temp. normal; pulse-rate falling. Point 1: tonsillitis; temp. 102° F.; pulse-rate up. Period 1–2: no relapse; steady improvement. Point 2: rise in pulse-rate, cause.

CASE 5 (Sheldon's Case 28).—Period 0–1: very slow improvement. Point 1: unexplained slight pyrexia. Period 1–2: slow improvement. Point 2: rise of temp. Point 3: further fever; carditis developed; aspirin started. Period 3–4: quiescent. Point 4: rise of temp. Period 4–5: slight intermittent fever and temp. 99° F. Point 5: temp. 101°; aspirin omitted few days before. Period 5 onwards: intermittent temp. 100·5°.

CASE 6 (Sheldon's Case 29).—Period 0–1: condition improving. Point 1: slight fever. Period 1–2: quiescent. Point 2: relapse: temp. 101° F.; pulse-rate raised: pain in knee. Period 2–3: quieter. Point 3: temp. 101°; throat red. Period 3–4: temp. normal: pulse-rate a little higher than period 0–1. Point 4: temp. 101°; pains in forearms; pulse-rate unchanged. Period 4 to end: temp. normal: improving; pulse-rate falling.

CASE 7.—Aortic and mitral disease. Period 0–1: settling down after several relapses. Point 1: erythema marginatum; slight temp. Period 1–2: progress good except for a few days unexplained rise of pulse. Point 2: slight temp., 99·4° F., for several days. Period 2–3: progress maintained; sitting up. Point 3: temp. 103°; pulse-rate raised; throat red but not sore; aspirin. Period 3–4: no further fever; pulse-rate falls until aspirin omitted, when rise occurred.

CASE 8.—Mitral and aortic disease. Period 0–1: steady improvement since February, 1930. Point 1: slight unexplained rise of temp., 99°, and rise of pulse-rate. Period 1–2: steady improvement. Point 2: slight fever; slight rise of pulse-rate. Period 2 and onwards: doing well.

It will be seen that there is a close relation between the clinical findings and the sedimentation rate. Almost every variation in the sedimentation rate can be shown to have a corresponding clinical counterpart. In three of the cases aspirin was given; as pointed out by Sheldon, in this series some of the cases receiving aspirin appeared to have been benefited by it, but on leaving off the drug the pulse-rate rose and further cardiac damage was manifest. It will be seen that in two such cases (Nos. 3 and 5), although there was temporary clinical improvement, no improvement in the sedimentation rate was shown.

In practice the test is of use in several ways. The most obvious and probably the most useful is in gauging the progress of a patient, especially in diseases of long duration such as rheumatism and tuberculosis. It gives a reliable numerical index to the progress, good or bad, and thus enables a more certain valuation to be made of the efficacy of any line of treatment. Again its failure to return to normal gives an indication of the persistence of some active pathological process. It is hoped that as more data become available the sedimentation rate will prove to be a useful guide in determining the presence or absence of an *active* cardiac lesion. Also in the after-care of these children it should give an early indication of impending trouble.

My thanks are due to Dr. Collis and Dr. Sheldon for their cordial coöperation, to Dr. Sheldon for granting me access to his cases and notes at Cheyne Hospital, and especially to the sister and staff of the ward at Cheyne Hospital in which the work was done for the considerable amount of help they have given me.

ERYTHROCYTE SEDIMENTATION RATE IN RHEUMATIC FEVER.

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RHEUMATIC fever may be looked upon as a specific disease which may manifest itself to the clinician in several ways. It may appear as acute rheumatic arthritis, chorea, rheumatic carditis, and in many other less easily recognisable forms. The clinical diagnosis may be difficult, and is dependent on the elucidation of rather indefinite symptoms and signs. In any particular case when the diagnosis has been made, the line of treatment that is indicated depends on whether or not the disease is "active" or quiescent. There are certain investigations which are of value in making and substantiating the diagnosis of the disease, and are of assistance in following its course.

Amongst these the weight, the temperature, and the pulse-rate, the blood leucocyte count, the electrocardiographic finding, and the erythrocyte sedimentation rate are of real interest. It is in connexion with the last of these that the present paper is written.

In 1917, F. Fahraeus, a Swedish physician, discovered that in blood withdrawn from a vein and prevented from clotting the erythrocytes form a sediment more rapidly when certain pathological conditions are present than in the blood drawn from a normal person. Alteration of the sedimentation rate is thought to result from changes in the chemico-colloidal conditions of the blood depending upon the percentage of globular fibrinogen, and probably also the lipoids that are present.

THE INVESTIGATIONS.

We have carried out a series of investigations on certain children under treatment for juvenile rheumatism at Queen Mary's Hospital, Carshalton. We have applied the E.S.R. test to a number of children in the wards of the hospital. The test was done during the day. The technique was simple, and was as follows :—

From the child lying in bed 1 c.cm. of blood was withdrawn from a vein in the arm, added to 0·2 c.cm. of sodium citrate, well mixed, and then drawn up into the Westergren apparatus, which consists of special capillary tubes (2·5 mm. in bore) held vertically in a special stand. The tubes were then left at room temperature in the ward. At the end of one and of two hours the degree of sedimentation was ascertained by reading the lower level of the clear supernatant fluid. The figures indicate the length of a column of clear plasma above the settled erythrocytes, the end point being, in practice, a clear-cut line.

In our experience the figures for normal people are usually under 10 mm. at the end of the first hour and under 20 at the end of the second hour, though distinctly lower readings are usually met with in healthy persons.

The cases in col. 1, Table I., with readings higher than 30 for the first hour, 60 for the second hour, were all cases exhibiting definite and unquestionable evidence of active rheumatism ; almost all had some degree of pyrexia, and showed such signs as a pericardial rub, severe chorea, or developed rheumatic nodules, if the more classical picture of acute juvenile rheumatism was not present. The cases in col. 3 and 4 with readings of 7 for the first hour and 23 for the second hour and less were, with two exceptions, regarded as quiescent. Most of these cases were known to have been definitely active at some previous date, or showed signs of cardiac damage strongly suggestive of previous rheumatic infection.

The cases with readings of less than 30–60 for the first and second hours respectively were, on the whole, cases that would be regarded as quiescent when examined, but amongst them there were a relatively high proportion of patients who were not making very satisfactory progress, were not gaining weight or, generally, doing so well as those in cols. 3 and 4.

TABLE II.—*Erythrocyte Sedimentation Rates ; Seria Readings Taken on Six Boys.*

—	—	A.			B	
	1	2	3	4	5	6
	1st 2nd hr. hr.	1st 2nd hr. hr.	1st 2nd hr. hr.	1st 2nd hr. hr.	1st 2nd hr. hr.	1st 2n hr. hr
Nov., 1930		80–124				
Dec., ,,		11–27		25–50	8–14	
Jan., 1931	55–67	10–26	126–136	30–62	—	
Feb., ,,	48–75	—	—	—	—	4–6
March, ,,	—	—	—	—	—	—
April, ,,	11–26	—	53–83	37–67	6–17	6–1
May, ,,	5–15	4–11	3–10	18–46	8–22	7–1
June, ,,	4–10	6–12	—	4–12	4–5	—
July, ,,	8–21	—	7–18	—	—	—
August, ,,	4–10	12–32	9–23	14–36	—	—

Table II. has been compiled to show the type readings that we obtained.

The cases in Table II. are divided into two group —Group A, those that were "active" at the com mencement of the investigation and tended to becom "quiescent" ; and Group B, those that appeare to be "quiescent" throughout. Two cases may b recorded as typical.

CASE 1.—A boy, aged 13, began to have rheumatic pai about 14 weeks before admission, and definite chor about ten days before admission. When he was examin on Dec. 23rd, 1930, the chorea was of a severe type, ar

TABLE I.—*Rheumatic Children.*

One hundred consecutive readings of the erythrocyte sedimentation rate (E.S.R.) for the first and second hour.

Presence of clinical signs of active rheumatism A +.
Absence ,, ,, ,, ,, A –.

Presence of clinical signs of organic heart disease B +.
Absence ,, ,, ,, ,, ,, B –.

Case No.	E.S.R.		A.	B.	Case No.	E.S.R.		A.	B.	Case No.	E.S.R.		A.	B.	Case No.	E.S.R.		A.	B.
	1st hr.	2nd hr.				1st hr.	2nd hr.				1st hr.	2nd hr.				1st hr.	2nd hr.		
1	126	136	+	+	26	16	41	–	–	51	7	25	+	+	76	5	15	–	–
2	118	129	+	+	27	16	37	+	+	52	7	23	–	+	77	5	14	–	+
3	80	124	+	+	28	15	40	–	–	53	7	20	–	+	78	5	13	–	–
4	78	102	+	–	29	15	35	–	+	54	7	18	–	–	79	5	11	–	+
5	64	96	+	+	30	14	42	–	+	55	7	18	–	+	80	5	7	–	+
6	63	108	+	+	31	14	36	–	+	56	7	17	–	–	81	4	13	–	–
7	53	83	+	+															
8	48	75	+	+	32	13	37	+	+	57	7	17	–	+	82	4	13	–	–
9	45	76	+	+	33	13	29	+	+	58	7	16	–	–	83	4	12	–	+
10	43	80	+	+	34	12	23	+	+	59	7	15	–	–	84	4	11	–	+
11	37	72	+	+	35	12	21	+	+	60	7	15	–	+	85	4	10	–	+
12	37	67	+	+	36	12	21	–	–	61	6	24	–	–	86	4	10	–	+
13	32	64	–	+	37	11	32	–	–	62	6	22	–	–	87	4	10	–	+
14	30	62	+	+	38	11	29	–	+	63	6	21	–	+	88	4	10	–	–
15	30	60	–	–	39	11	28	–	+	64	6	21	–	+	89	4	9	+	–
16	28	50	+	+	40	11	27	+	+	65	6	20	–	+	90	4	6	–	+
17	26	60	–	–	41	10	26	+	+	66	6	18	–	+	91	3	10	–	–
18	24	59	–	+	42	10	24	+	+	67	6	18	–	+	92	3	9	–	–
19	21	44	–	–	43	9	28	–	–	68	6	18	–	–	93	3	9	–	–
20	21	43	–	–	44	9	24	–	+	69	6	17	–	+	94	3	8	–	+
21	22	46	–	+	45	9	23	–	+	70	6	17	–	–	95	3	8	–	+
22	19	44	+	–	46	8	24	–	+	71	6	16	–	+	96	3	7	–	+
23	18	46	–	+	47	8	22	–	+	72	6	15	–	+	97	3	7	–	–
24	17	42	–	+	48	8	21	–	+	73	6	15	+	+	98	3	6	–	–
25	17	40	–	+	49	8	19	–	–	74	6	12	–	+	99	3	6	–	–
					50	8	14	–	–	75	5	15	–	+	100	3	5	–	–

short blowing systolic murmur was found to be present t the apex. The sedimentation readings for January and February were 55–67 and 48–75 respectively. The condition hen improved, and by March the patient was free from horea and had gained about half a stone in weight. During he remainder of his stay in hospital he made satisfactory progress, and the sedimentation rates remained low.

Case 2.—A boy, aged 12, had a history of recurrent attacks of acute rheumatism, almost yearly since 1923, or which he had received a certain amount of hospital reatment. On admission in November, 1930, the temperature was 103° F., both knees were swollen and painful, and the ankles and wrists had been swollen during the 24 hours prior to admission. There were signs of endocarditis, probably of long standing. A pericardial rub was present a few days after admission, and the sedimentation rate taken about a fortnight after admission was 80–124. There was a fairly steady improvement in this boy's condition, and a steady gain in weight. This was accompanied by a fall in sedimentation rate. The pericardial rub was of short duration, though the murmur of valvular origin remained unchanged throughout.

The cases in Group B, Table II., were all boys who gave histories of acute rheumatism at some time, but who were clinically quiescent during the period of the investigation. They all showed evidence of organic heart disease.

It seems from these figures that the sedimentation rate is high when there are clinical signs of active rheumatism, and low when the disease is quiescent. The rate is apparently uninfluenced by the degree of cardiac damage that is present.

CONCLUSIONS.

As the result of this investigation we consider that when the clinical picture is that of juvenile rheumatism in an active phase, the blood sedimentation rate is definitely raised; when it is that of quiescent rheumatism or rheumatic heart disease unassociated with clinical signs of activity, the rate approaches normal limits. We feel that further and detailed examination may show that the E.S.R. is of real value in diagnosis of now doubtful cases.

As the result of our clinical experience we have taken as a normal figure, below 10 mm. at the end of the first hour, below 20 at the end of the second hour as the erythrocyte fall as estimated by the Westergren method. In those cases which showed definite clinical signs of active infection the rate varied from 126 to 30 at the end of the first hour, and 136 to 60 at the end of the second hour. In those cases showing no clinical evidence of active infection the reading varied from 9–3 at the end of the first hour, and 20–5 at the end of the second hour.

In a series of cases in which the sedimentation rate was taken at regular intervals during the child's stay in hospital the readings showed that as the active phase subsided the blood sedimentation rate tended to fall.

From these preliminary tests we feel that further investigation should be carried out to determine whether or not the blood sedimentation test should be included with the weight, the temperature, and the pulse-rate in the routine investigation of the rheumatic child. In practice in dealing with rheumatic children we suggest that in a child with a sedimentation rate of 11–21 or over active disease should be suspected in the absence of the usual clinical signs indicative of activity. If there is no clinical evidence of other infection, such as acute rhinitis or sinusitis, the presence of a definitely raised sedimentation rate may be taken as sufficiently suggestive evidence to necessitate the treatment of the case as one of active infection.

In our opinion this test is of value in the consulting room as an aid to the initial differentiation between active and non-active juvenile rheumatism which in practice means the decision as to whether or not the child shall be nursed in bed. It is also of value, if estimated at regular intervals during the course of treatment, in deciding when the active infection has subsided and if the child should be allowed to get up. If the sedimentation rate remains above normal limits special precautions should be taken, and this usually indicates that the child should be kept in bed until the E.S.R. falls. If the E.S.R. is persistently low, there is little danger in allowing the child to resume a normal life.

PEPSIN THERAPY OF GASTRIC AND DUODENAL ULCER.*

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The great importance of hydrochloric acid in the genesis of the peptic ulcer, upheld by numerous experimental tests, is also proved by clinical experience—e.g., (1) the site of origin can only be where the gastric hydrochloric acid has access; (2) in a healing, cicatrising ulcer the hydrochloric acid content usually decreases; (3) by removing the pyloric portion of the stomach together with the antrum, we achieve a permanent achylia, thereby preventing a recurrence of the peptic ulcer. Since, therefore, hydrochloric acid is the sine qua non for the genesis of the ulcer, the exciting cause must be sought in some local disposition which may be quite trifling: a small hæmorrhage or an embolus of a small end-vessel of the gastric mucous membrane with necrosis. Such small local sites of irritation may appear as a consequence of the most various injuries: toxins (nicotine), infections (anaphylactic injuries such as have been observed by the Italians[1] after injections of horse serum), nerve lesions (vagus injuries), and local and cerebral arterio-sclerotic changes, which Hart states can bring about such disturbances.

I pointed out these causes as far back as 1912, and later, in 1921 at the Congress of Natural Philosophers in Leipzig, I was able to show that we can succeed in producing artificial ulcers of the skin and of the mucous membranes by injecting gastric hydrochloric acid intracutaneously or intramucously. I produced genuine ulcers in rats, guinea-pigs, and rabbits by this means. After intramucous injection a pustule first appears with clear, then cloudy contents; a necrosis develops and the dead tissue falls off in about ten days, giving place to a roundish ulcer with a flat or deep base and slightly upturned rims, healing with a scar in about four weeks. Such intramucous ulcers take root with far greater difficulty in that portion of the stomach which has covering cells than in the region of the main cells—the central portion, for instance—a sign that cell disposition also plays a part, and that antipepsin is perhaps confined to certain cells. Guinea-pigs are the best subjects for intracutaneous experiment. The experimental skin ulcers, if left to themselves, required four to six weeks for healing, but if a neutral pepsin solution was injected subcutaneously, healing was much more rapid; a fully developed ulcer retrogressed after a fortnight. The chief idea was that the pepsin did not act as a simple irritant but—being the strongest ferment of the human body—was an external, and probably also an internal, hormone of the covering cell gland which we call the stomach.

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* Read before the Medical Society, Vienna, on June 19th.

The gastric juice of normal persons and of ulcer patients differs biologically. If, for instance, the gastric juice of a normal individual is introduced beneath the skin of a guinea-pig, a slight necrosis will result; this will become a rapidly spreading extensive ulcer if the gastric juice of an ulcer patient is added. The process can be shown still more distinctly on the cornea of experimental animals, in which an erosion painted with ulcer gastric juice takes much longer to heal than an erosion painted with normal gastric juice.

PEPSIN THERAPY.

I have made these facts the basis of a clinical treatment of ulcer and E. Moser,[2] of Zittau, verified my experiments.

This subcutaneous pepsin therapy, which I have now been practising for about five years, entailed much important preliminary work. To begin with, pepsin cannot be sterilised, as a ferment loses its effectiveness at a temperature of above 36°. This was a most difficult problem, the more so as the ferment researchers persisted in maintaining that enzymes do not pass through a filter and that a filtered pepsin solution must be ineffective. This, however, is not the case. Filtering pepsin through porcelain filters under pressure renders the solution free from albumin, but it does not lessen the ferment contents. Thus the pepsin was freed from germs by porcelain filtration; at the same time an antiseptic (diluted carbolic acid) was added to keep the filtered solution free from germs. Absolute neutrality is essential, for the slightest variation will cause local injuries on the skin which render treatment very difficult. Injections of pepsin solutions prepared by my method are harmless and painless. Sometimes, to be sure, larger doses produce certain—probably anaphylactic—phenomena: swelling and reddening of the skin and of the hypodermic cell tissues, slight rises of temperature, and a feeling of fatigue; and occasionally we have observed local exanthemata. But these reactions are exceptional and easily avoided by careful, individual dosage. That the pepsin action is not an albumin action is shown by the facts that the therapeutic effect is lost by boiling and that the filtered solution is free from albumin.

METHODS OF APPLICATION.

I have—after long experience—evolved the following formula. Twice in a year the patient receives a series of 30 injections, increasing and decreasing. The Austria Pharmacy in Vienna† has, for the last two years, put on the market ampoules ready for use. I begin with 0·2 c.cm. and give three injections either daily or every other day; after three injections I increase to 0·3 c.cm.; after three further injections to 0·4 c.cm., after three further injections to 0·5 c.cm. I stop at 0·5 c.cm. for 12 injections, then decrease again to 0·4 c.cm. three times; 0·3 c.cm. three times, and 0·2 c.cm. three times; the series ends at 0·2 c.cm. If anaphylactic symptoms appear, it is wise to use the next lower dose and proceed again; but it is also quite possible to stay consistently at a lower dose without any increase.

Up to date I have treated more than 600 cases, mostly in hospital or ambulatory; ambulatory treatment is quite possible, as the therapy need not interfere with work. Gastric and duodenal ulcers represent the chief material. The new therapy was applied to all ulcers which offered no strictly surgical indication—e.g., stenosis, perforation, severe perigastritis, sudden hæmorrhage under certain conditions, or suspected carcinoma. Œsophageal and jejunal ulcers were also treated. We left gastric hæmorrhages without treatment for three weeks before beginning injections.

I am able now to give a report of about 130 cases which were observed in my ward; we had 23 gastric and 105 duodenal ulcers and two jejunal ulcers. These cases were examined as follows: acid values determined, patient X rayed, weight taken before and after treatment, examination of stools; in many cases neutral red evacuation and test of local sensitiveness to pressure; finally, the subjective feeling (pain, fullness, heart-burn regurgitation of food) was registered. The determination of the acid values, of weight condition, and X ray examination before and after treatment gives a good picture of the great effectiveness of the therapy.

(*a*) In 50 out of 94 thoroughly examined cases the acid values decreased, and in 44 cases they remained stationary or even increased; *this strange* result has nothing to do with the effectiveness of the therapy, save that it shows that the potentiality of ulcers still exists, the danger of a relapse being imminent. In these cases a repetition of the therapy is necessary, for only when th acid values—particularly the value of the fre hydrochloric acid—decrease steadily can the conditio be regarded as cured or clinically latent. It i interesting that in cases of ulcer with low acid value an increase was frequently noticed; it was just thes cases that exhibited a particularly good healing tendency.

(*b*) The weight was accurately examined in 9 cases; eight cases remained constant (8·8 per cent.) six cases showed a decrease of weight which varie between 0·5 and 2·5 kg. (6·2 per cent.); on the othe hand, 80 cases (85 per cent.) showed an increase o weight which amounted to 14 kg. We were als able to achieve increase of weight by the use o pepsin in other cases where weight was lost.

(*c*) It is difficult to explain the changes in th radiographic findings, since changes in the mucou membrane surface are frequently irreparable, even i the ulcer is healed. However, I was able, upon th absolutely objective examination by our radiologis at the hospital—I never undertook this examinatio myself—to establish positive improvement in 72· per cent. This improvement consisted either in th disappearance of sensitiveness to pressure; in norma formation of the duodenal cap; in disappearanc of niches and filling *defects; and in* better evacuatio In 27·6 per cent. the radiogram remained unchanged In a great number of cases the highly important six hour residue had disappeared.

(*d*) The neutral red test was made in a great numbe of cases. Here, also, the prolongation of the time o secretion was an important criterion of improvement In cases where the time of secretion had not decreased the series of injections was repeated. The procedur is very easy: injection of 5 c.cm. of a 1 per cent neutral red solution and examination of the gastri juice of the empty stomach with the duodenal probe Normal individuals evacuate the pigment aft 15 minutes, ulcer patients in a shorter time, cases o hypochlorhydria in a longer time, and achylics not a all (Glaessner and Wittgenstein). About 70 per cent of the cases showed a reduction of the time o evacuation.

(*e*) Occult blood soon disappeared under the treat ment. In 11 cases of very severe hæmorrhage the blood disappeared from the stools.

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† Vienna, ix., Währingerstrasse, 18.

(*f*) The blood picture before and after the pepsin injections showed a gradual increase of value, even in cases of severe hæmorrhage. I found in general an increase of the eosinophils up to 8–10 per cent., and a leucopenia at the expense of the lymphocytes—I sometimes found 3–5 per cent. of lymphocytes. Perhaps pepsin, like certain albumoses, produces the eosinophilia.

(*g*) The subjective phenomena improve very soon. Disappearance of pain is often observed after six or seven injections. The sensitiveness to pressure diminishes; the feeling of fullness, the repeating of food, the heart-burn, the pain at night and from hunger, the painful sensation of the empty stomach, all relax. The patients are rarely refractory; about 5 per cent., in spite of the cure, still had pain. Only five of our 130 cases went to the surgeon (4 per cent.).

Even if the patient makes no complaint, I am in favour of repeating the treatment twice in the year for two years; relapses occur sometimes. I have seen from 10 to 15 per cent. of relapses which were to be attributed to the fact that the patients were hospital cases belonging to the labouring classes and could not follow my directions. In cases which do not improve promptly we suspect other processes—e.g., cholecystitis, lymphogranuloma, tuberculosis and other affections of the pancreas, and cancer.

(*h*) Besides the injections the following factors are part of my routine: before meals the patients take olive oil, about 50 c.cm. per day (five tablespoonfuls), and after meals a bismuth-preparation; bismuth carbonate, "bismoterran," or bismurated magnesia have proved satisfactory. All belladonna preparations are avoided and other drugs—sodium bicarbonate in particular—are cut out. If there has been no hæmorrhage or inflammation the patients have a mixed diet, the customary milk and fasting cures in particular being avoided. We give them mixed milk and cream and whipped cream. Sugar and honey agree with some patients, but not with all. They can also have eggs, soft cheese, milk dishes, vegetables of all kinds passed through a strainer, mashed potatoes, rice, hashed white meat, fish, and farinaceous food well greased. Soups should be prepared of vegetables or cereals; small quantities of bacon, unsweetened cooked fruit, toasted bread, or zwieback (rusks), and alkaline waters should be given. The quantity of each article of food is about 100 g., but the patient should always feel satisfied; he therefore takes numerous small meals—six a day.

Besides the injection treatment, medicines, and diet, a few physical measures deserve consideration—e.g., lying on the right side after eating, thermophore or mud packing, and daily stools (bismuth preparations).

RESULTS.

It is not easy to state the results of the treatment in figures. In the following table only objective factors are stated.

Cases observed, 130: operated on, 5 (4 per cent.); severe hæmorrhage, 11 (9 per cent.).

Of 94 fully investigated cases—

Acid values ..	Unchanged or higher..	44	(47 per cent.)
	Lower	50	(53 " ")
X ray findings	Unchanged	26	(27·6 " ")
	Improved	68	(72·4 " ")
Weight ..	Unchanged	8	(8·8 " ")
	Reduced	6	(6·2 " ")
	Increased	80	(85 " ")

Besides gastro-duodenal ulcers, jejunal, œsophageal, and other ulcers may also be favourably influenced by pepsin injections. Mucous membrane ulcers of the mouth and pharynx rapidly improve, while ulcers of the lower leg and of decubitus granulate in a surprisingly short time. Similar observations were made by Moser, who achieved complete cures of radiographic ulcers. The ulcers of diabetics and nerve patients retrogress quickly, and we have seen a few most encouraging cases of ulcerative colitis. In pernicious anæmia we have likewise had encouraging results with pepsin injections. Here the pepsin probably acts as a gastric mucous membrane extract, like "ventæmon" or "stomopson."

In 1930 Loeper, Debray, Michaux, and Mlle. Sainton published [4] an article entitled Le traitement de l'ulcus par les injections hypodermiques de "Pepsin" in which, ignorant of my publications as far back as the year 1927, they record a small number of cases in which the cure of gastric or duodenal ulcers was effected by pepsin injections. In the following year (1931) [5] I claimed my priority, which Loeper and his collaborators were obliged to acknowledge. Nevertheless, the article of the French authors is a complete confirmation of my statements and results, and it is pleasant to think that investigators completely independent of each other should arrive at the same satisfactory results.

Recently W. Hertzer published a thesis [6] which treats of experiments carried out at Kuttner's instigation in the Rudolf Virchow Hospital in Berlin; The author records 12 cases in which he tested my method; in all these, save one, he achieved the same results as I, and even more favourable ones. After 20 injections of pepsin all the patients were free from pain and trouble; the increase in weight varied between 2·6 and 6·4 kg.; the acid values were—as in the patients under my observation—somewhat increased in a few cases while in others they changed little or became subnormal; the X ray findings showed a striking improvement and were pathological after the cure in only two cases; the blood disappeared in all cases. No medicine was administered besides the injections, and a normal diet was given. During the treatment no complications occurred, and except in one case no local reactions or fever were ever observed. The treatment was carried out with the pepsin injections prepared by the Austria Pharmacy in this city, according to my directions. This is a splendid proof of the effectiveness of the therapy.

SUMMARY.

Pepsin injection therapy can, in about two-thirds of the cases of uncomplicated duodenal and gastric ulcer, bring about an objective and subjective cure. Of the last 100 cases which were observed, more than half showed an improvement of the acid values, about three-quarters one of the X ray finding, and four-fifths one of the weight curve. Remittent treatment is recommended: in addition, only indifferent medicines and a plentiful diet are prescribed. Only 6 per cent. of the cases had to undergo operation. Other ulcer formations also (mucous membrane, skin, decubitus, intestinal) may be cured by this treatment. It is a specific therapy and depends more on hormonal factors than on the action of irritants.

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LOW SPINAL ANÆSTHESIA.

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Low spinal anæsthesia—or to give it its academic title, intrathecal caudal anæsthesia—consists in the injection of a suitable drug into the subarachnoid space so that the resulting anæsthesia is limited to the caudal region. Its use is therefore confined to operations involving the perineum, and it has a wide application in those gynæcological, genito-urinary, and rectal operations which take place in this area. During the past two and a half years I have used this form of anæsthesia in about 600 cases at St. Mark's Hospital and elsewhere. In the majority of these the operation has been for rectal conditions such as hæmorrhoids, fissures, and fistulæ.

TECHNIQUE AND MANAGEMENT.

The technique varies somewhat according to the anæsthetic agent employed. As Howard Jones[1] has said, "The movement of injected solutions is determined by their relative weight." If, therefore, a solution of higher specific gravity than cerebro-spinal fluid is introduced into the spinal canal it will at once tend to sink. This fact can be demonstrated by injecting a solution such as 10 per cent. stovaine in saline into a patient lying on his side. If the patient is allowed to remain on his side after the injection, his lower leg will become anæsthetic and paralysed and the upper one will be unaffected. It follows that for low spinal anæsthesia produced by means of a heavy solution, the patient should adopt the sitting posture during and for a short time after the injection, so that the solution may gravitate downwards and act only on the sacral nerves. If, on the other hand, it is decided to use a solution of lower specific gravity, such as percaine 1 : 1500 or 1 : 1000, the patient should, after injection, be placed prone in the horizontal position or with the head of the table slightly lowered.

In nearly all my cases I have used 10 per cent. stovaine in saline, and am now using it as a routine. Although this has for many years been called the "light" solution it has a specific gravity of 1080 and, besides being heavier than cerebro-spinal fluid (average specific gravity 1007), it is also heavier than the so-called "heavy" solution which contains 5 per cent. stovaine with 5 per cent. glucose in distilled water (specific gravity 1023).

The patient is given a preliminary narcotic injection about three-quarters of an hour before operation. On arriving in the anæsthetic room he is asked to sit up and place his feet on a stool at the side of the table. The skin over the spinal column is prepared by painting with iodine and the patient is asked to bend forwards. An injection of novocain (1 per cent. or 2 per cent.) is given intradermally and subcutaneously over the most convenient lumbar intervertebral space. Although the space between the fourth and fifth lumbar vertebræ is the site for choice it may be difficult to locate, especially if the patient is stout. In these circumstances it is often easier to palpate the spines of the third or the second lumbar vertebræ and to inject in the space below. I have also given the injection between the fifth lumbar vertebra and the sacrum.

The spinal needle is then inserted in the middle line. As soon as it enters the theca, and the cerebro-spinal fluid runs freely, an injection is given of between 0·4 and 0·5 c.cm. of the stovaine solution. The injection is made slowly to avoid unduly mixing the stovaine with cerebro-spinal fluid. After the needle is withdrawn the patient remains sitting for about two minutes. This allows time for the stovaine to gravitate downwards and act only on the lowest sacral nerves. The patient can then be placed on his back and wheeled into the theatre.

By the time the patient has been moved to the operating table, placed into position, and prepared for operation, anæsthesia is usually complete. In most cases five minutes is ample time between the spinal injection and the first incision, though it occasionally takes two or three minutes longer for complete anæsthesia to develop. The patient may be conscious of deep pressure at the start but this rapidly disappears.

If the area of anæsthesia is tested it is found that usually the only nerves to be affected are the third, fourth, and fifth sacral. This means that a saddle-shaped area of anæsthesia is present in the perineum and the patient retains complete sensation in and the full use of his legs. Sometimes the second sacral nerve is affected also and a band of anæsthesia is found at the back of the thigh reaching as far as the popliteal space. There is also anæsthesia of the penis and scrotum, though this may be only partial if the second sacral nerve has remained unaffected. With still higher anæsthesia the foot becomes numb and the patient speaks of tingling in the legs even if full anæsthesia does not occur.

As a general rule, the higher in the lumbar region that the injection is given, the more extensive will be the area of anæsthesia. If the stovaine is introduced between the fifth lumbar vertebra and the sacrum it is highly improbable that any nerves above the third sacral will be affected. If, however, it is given in the second or third lumbar interspace there is usually some anæsthesia and paresis in the legs. Area of anæsthesia will also vary with the dosage. An injection of 0·3 c.cm. of stovaine may limit anæsthesia to a small area round the anus which, while it may permit an operation for hæmorrhoids to be performed, is insufficient for the treatment of a large fistula in ano. An injection of 0·4 c.cm. appears to be the best dose for rectal operations, while for genito-urinary work it is as well to give 0·5 c.cm. to ensure blocking the second sacral nerve. Nor is the area of anæsthesia always symmetrical. It oftens happens that the third sacral nerve is the highest affected on one side and the second is paralysed on the other; or one leg may be partially anæsthetised and the other not at all. In no case, however, has anæsthesia been high enough to operate on an inguinal hernia.

With anæsthesia confined to the sacral region only a small portion of the sympathetic nervous system is involved and consequently there is no drop in blood pressure. The patient need not have his head lowered, and many of my cases have enjoyed the use of two pillows during operation, thus having the level of the head higher than that of the abdomen. There is no pallor nor faintness, nor have any of the patients complained of the nausea and sickness which is commonly found in those who have had the whole abdomen anæsthetised by means of spinal anæsthesia. Any action which the stovaine may have in producing toxic symptoms is completely absent in this form of anæsthesia, and in no case has the patient's condition given cause for concern.

A bandage is usually placed round the patient's eyes before entering the theatre, though many prefer to do without it. In any case there is little to be seen by a patient lying in the lithotomy position. One patient, seen in private practice, was content to read his morning paper while his hæmorrhoids were being removed. Absence of apprehension has been a striking feature of this method.

POST-OPERATIVE CARE.

As there is no drop in blood pressure it is not necessary for the patient to lie with the foot of the bed raised on blocks when taken back to the ward.

Two precautions are taken against the occurrence of post-operative headache. Firstly, the injection of anæsthetic is made with a fairly fine spinal needle (standard wire gauge 20), and the bevel of the needle is made to face laterally while puncturing the dura mater. This is the method advocated by Labat[2] to reduce the size of the puncture hole and thus minimise draining away of cerebro-spinal fluid. Secondly, the patient is, on his return to the ward, encouraged to lie still for the rest of the day and not more than one pillow is allowed.

Post-operative headache has been comparatively rare among these cases, and as far as I have been able to ascertain has not lasted for more than a few hours when present. When it does occur, the patient should be made to lie flat, preferably without a pillow, and aspirin or phenacetin should be given by mouth. It is interesting to note that among 24 cases described by Spencer[3] in the United States only one case of headache is recorded, although the patients were allowed to get up and go home an hour or two after having their operations performed under low spinal anæsthesia. The exception, a man of 26, "left the office at 10.30 P.M. with instructions to go home to bed. He did so, but arose again at 1.30 A.M. and drove a milk wagon for several hours."

Only one other complication has occurred among these cases. I refer to an occasional instance of retention of urine. It is difficult to estimate the part, if any, played by spinal anæsthesia in causing this as it may also occur after perineal operations when the patient has had a general anæsthetic. A useful preventive measure is to encourage the patient to attempt micturition every hour for the first three or four hours after operation.

ALTERNATIVE ANÆSTHETIC AGENTS.

In addition to the 10 per cent. stovaine in saline I have also used the solution composed of 5 per cent. stovaine and 5 per cent. glucose in distilled water. It appears to work equally well and I have usually injected 0·7 c.cm. as the dose. Silverton,[4] in Sydney, employs an even smaller dose of this solution. He found that 2 cg. (0·4 c.cm.) of stovaine was enough to provide anæsthesia for cystoscopy and most perineal operations, and that 3 cg. (0·6 c.cm.) was necessary for litholapaxy and perineal prostatectomy.

I have also used a solution of percaine 1 : 1000 with 5 per cent. glucose added to raise the specific gravity of the solution. An injection of this (2 c.cm.) gives a satisfactory perineal anæsthesia but it does not appear to have any advantages over 10 per cent. stovaine in saline. The anæsthesia takes rather longer to develop. If plain percaine 1 : 1500 is used an injection of 5 or 6 c.cm. is necessary and this again takes a few minutes longer to act than stovaine. It is probable that for low spinal anæsthesia percaine, when used, should be in greater concentration, and Howard Jones[5] advocates the use of 0·5 to 1·0 c.cm. of 1 : 100, or 1 to 2 c.cm. of 1 : 200 solution. This may produce anæsthesia for as long as six to eight hours. The only advantage of such a prolonged action would appear to be in diminishing the need for post-operative sedatives.

In the United States, Pitkin[6] and McCormack have employed low spinal anæsthesia in obstetrics. Finding that the use of spinocain was impracticable they substituted glucose for the alcohol and increased the strength of novocain in the solution from 10 per cent. to 40 per cent. Their heavy solution is on the market under the name of Gravocain and, with such a concentration of novocain, the addition of glucose seems unnecessary to make the solution heavier than cerebro-spinal fluid. Spencer[3] has also used this, chiefly for genito-urinary work. It has been his practice to perform minor perineal operations on patients in his surgery after which they may return home within an hour or two, walking if necessary.

I have not used simple solutions of novocain for low spinal anæsthesia, but it would no doubt prove perfectly satisfactory for those who prefer this drug to stovaine. I have found stovaine so extremely efficient for this form of anæsthesia that I hesitate to make a change.

CONCLUSIONS.

From the foregoing remarks it will be seen that low spinal anæsthesia may be employed with advantage for a large variety of operations. Among these are the following: circumcision, operations for stricture, such as internal urethrotomy and the passage of dilators, cystoscopy when an anæsthetic is required, litholapaxy, diathermy to bladder or prostate, perineal prostatectomy, operations for hæmorrhoids, fissures, and fistulæ, insertion of radium into carcinoma of the rectum, and in the operative treatment of rectal prolapse. Pitkin has also used it in obstetrics and for dilating and curetting the uterus. In the last-mentioned operation he found that dilatation of the cervix was painless but that curettage of the uterine fundus caused some discomfort. It is not suitable for operations on the testicle, as this organ is not supplied by the sacral nerves.

Low spinal has certain definite advantages over other forms of anæsthesia. The nausea and vomiting which occur after a general anæsthetic are absent, nor does the patient require to be watched while the effect of the anæsthetic is passing off. There are no circulatory and respiratory disturbances such as are caused by the administration of a general anæsthetic. If tests for renal function are being carried out by intravenous injection of indigo-carmine, there is no delay in the excretion of the dye such as occurs when the patient is under general anæsthesia.

Lundy[7] and Buie,[8] both of the Mayo Clinic, strongly urge the claims of caudal and trans-sacral blocks for surgery of the perineum. Used by itself caudal block anæsthesia takes longer to develop and, in my experience, causes more discomfort to the patient than a spinal injection. Moreover, the anæsthesia produced is not so profound as with a spinal anæsthetic and a certain percentage of failures is usual. If a trans-sacral block is given also, good anæsthesia results but greater time is required for administration. Nor can the anæsthetist hope to become proficient in the technique of producing a trans-sacral block without considerable practice. Low spinal, on the other hand, is easy to administer, rapid in action, almost painless to the patient if given with care, and provides a profound anæsthesia for the area of operation. There is no drop in blood pressure and the patient's sense of wellbeing is not disturbed as with higher forms of spinal anæsthesia. With careful administration it should be successful in every case, and so far I have seen no case out of 600 where anæsthesia was unsatisfactory and had to be supplemented.

The views of two surgeons who have had considerable experience with this form of anæsthesia may with advantage be quoted here. Milligan,[9] says:

> "Low spinal, or spinal anæsthesia limited to the sacral nerves, has advantages which render it of the greatest value for operations on the perineum. It is reliable . . . It is a controllable anæsthetic and has none of the disadvantages of the higher spinal anæsthetics. . . . The administration of the anæsthetic is simple and is quickly carried out. It is not unpleasant to the patient and is convenient to the operator if he is skilled in the technique. Anæsthesia is complete in two or three minutes. Apprehension before operation can be abolished by suitable injections. For hospital work it is ideal."

Silverton,[4] in New South Wales, says: "This is, as it were, an example of an almost perfect form of regional anæsthesia induced with great rapidity by a very simple technique."

SUMMARY.

1. For operations on the perineum low spinal is a very satisfactory method of producing anæsthesia. 2. It is easy to administer, rapid in action, and provides good anæsthesia limited to the area of operation. 3. There is no drop in blood pressure, and the condition of the patient remains good throughout. 4. These advantages should be applicable to 100 per cent. of cases.

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ON A DIVERGENCE BETWEEN THE BIOLOGICAL AND GAMMA RAY EFFECTIVENESS OF RADIUM TUBES.

BY S. RUSS, D.SC. LOND., AND G. M. SCOTT.

From the Barnato Joel Laboratories, Middlesex Hospital.)

IN radium therapy use is made of many types of tubes and needles of varying degrees of screening; they are generally made of platinum, but occasionally of other metals, such as silver, lead, brass, or monel metal. Whatever the metal may be, the question often arises—what is the optimum thickness? This does not seem to be an easy question to answer. The object of this note is to draw attention to the fact that platinum radium tubes of the *same* normal gamma ray output will have a varying biological range of effect, which does not simply depend upon the degree of gamma ray absorption by the platinum.

In order to illustrate the point in question reference will be made to tubes of only three thicknesses—2·0 mm., 0·6 mm., and 0·3 mm. of platinum. These tubes were all the same length (2·0 cm.), and their specifications are given in Table I.

It will be seen from this Table that the actual content of the three tubes does not vary much, but there is naturally a marked difference in the gamma ray activity of the three tubes, due to the difference in screening. The tube with walls of 0·3 mm. is 5 per cent. more active than that with walls of 0·6 mm., and the one with 0·6 mm. walls is 18 per cent. more active than that with 2·0 mm. walls. This difference in the gamma ray effectiveness of these tubes would be measured in any physical laboratory where gamma ray measurements are carried out with an electroscope with walls of not less than 3 mm., the thickness calculated to allow only gamma rays to enter.

TABLE I.—*Details of Tubes.*

Tube.	Wall thickness of platinum.	External diameter.	Actual radium content.	Gamma ray activity.
A	2·0 mm.	5·0 mm.	3·00 mg.	2·42 mg.
B	0·6 „	2·2 „	3·08 „	2·87 „
C	0·3 „	1·6 „	3·14 „	3·03 „

It is common knowledge that gamma rays, like X rays, when incident upon material substances cause electrons to be emitted, and the gamma rays passing through the platinum tubes will cause streams of beta rays to issue from the tubes; but the ordinary gamma ray measurements obviously take no account of this. Such beta rays constitute an easily absorbed type of radiation which, although it is not detected by the gamma ray electroscope, will have a marked effect on the tissues within a limited zone around any tube or needle.

Ionisation measurements have been made with tubes of the three different thicknesses of platinum mentioned above to find out how far this easily absorbed radiation would extend into the tissues. An ordinary cubical electroscope (with 10 cm. sides) made of thin aluminium foil (0·18 mm.) was used, so that any ionisation produced by easily absorbed radiation would be measured, as well as that due to the primary gamma rays.

The central axes of the tubes were set vertically 18 cm. from the electroscope, and comparisons made between the actual ionisation measurements obtained and the ordinary gamma ray measurements. The tube with a 2 mm. wall thickness was used as a basis for comparison with the other tubes, and the amount of ionisation registered per mg., after allowing for the absorption by the 2·0 mm. platinum walls of the tube, was decided on as 100 per cent.; similar ionisation measurements of the other tubes were then compared with this. It was found, after the necessary absorption allowances, that the tube with a wall of 0·6 mm. platinum gave 113 per cent. ionisation, and the 0·3 mm. tube 145 per cent. to 165 per cent. The variation in this latter figure was due to the fact that the wall of the 0·3 mm. tube was not

TABLE II.

Platinum tube walls 0·6 mm. Radium 3·08 mg.			*Platinum tube walls 0·3 mm.* Radium 3·14 mg.*		
Thickness of paraffin.	Ionisation (per mg.) compared with— that of same tube unscreened.	that of 2 0 mm. platinum tube.	Thickness of paraffin.	Ionisation (per mg.) compared with— that of same tube unscreened.	that of 2 0 mm. platinum tube.
	Per cent.	Per cent.		Per cent.	Per cent.
Nil ..	100	113	Nil ..	100	165
1·4 mm.	104	117	1·7 mm.	94	155
3·4 „	104	117	3·7 „	82	135
5·4 „	98	115	5·7 „	74	122
7·4 „	97	114	7·7 „	68	111
9·4 „	88	103	9·7 „	64	105

* For all these observations the thinnest side of the tube was kept directly facing the electroscope.

uniform; as this tube was turned round the vertical axis the ionisation figures varied from 145 per cent. o 165 per cent.

As these data showed that if the tubes with walls of 0·3 mm. platinum instead of 2·0 mm. were used biologically, as much as 65 per cent. more radiation might come into play, the lightly screened tubes were coated with paraffin of almost as great a density as the soft tissues of the body, and observations were made to see how much paraffin was needed to obtain he same percentage ionisation effect with these ubes as that given with tubes with walls of 2·0 mm. Table II. shows these ionisation figures.

These observations show that to reduce the percentage ionisation of these tubes to the level of that from the 2·0 mm. platinum tubes, about 1 cm. of paraffin wax (density 0·93) is needed; the equivalent thickness to this in the softer tissues of the body would be about 9 mm. This contributory radiation of easily absorbed type gives these tubes a biological effectiveness quite apart from the smaller absorption of the primary gamma rays that is entailed.

Recently Sven Benner [1] and Piccard and E. Stahel [2] have shown that there are significant differences in the degree to which beta rays are emitted from different metals under gamma irradiation. It may be that some of the excessive reactions that have been noted when lightly filtered tubes have been used can be explained to some extent on these lines. This does not mean to imply that differential action may not also be looked upon as an explanatory factor.

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[1] Acta Radiol., 1931, xii., Fasc. 4.

[2] Strahlentherapie, 1930, xxxvi., 347.

CLINICAL AND LABORATORY NOTES

A SOURCE OF ERROR IN MEASUREMENTS OF URINE SECRETION,

INCLUDING RENAL EFFICIENCY TESTS.

By Phyllis M. Tookey Kerridge, M.Sc., Ph.D. Lond.,

and

Arthur Ellis, M.D. Toronto, F.R.C.P. Lond.,

DIRECTOR OF THE MEDICAL UNIT, LONDON HOSPITAL; PROFESSOR OF MEDICINE IN THE UNIVERSITY OF LONDON.

In many of the tests of renal function used in medical practice, failure to empty the bladder completely will lead to gross discrepancies. While this danger is well recognised, it is commonly regarded as an unusual complication, and as associated only with recognisable causes of obstruction. In studying records of urinary secretion, in which each specimen passed over long periods of time was measured, we have found figures which suggest that incomplete emptying of the bladder is not uncommon and that it occurs in the absence of any obvious cause of obstruction. It has therefore seemed worth while to publish these observations so that an appreciation of the importance of this factor as a source of error in such determinations may be more generally recognised.

Some patients with nephritis were observed to pass 150–350 c.cm. of urine within an hour of having previously passed urine. This second specimen was not dilute, but had approximately the same specific gravity and chloride, creatinine and protein concentrations as specimens passed before and after. This behaviour was noticed in four out of 16 cases in which records were kept of each specimen of urine passed over a period of several weeks. *In one patient*, this happened 24 times in 13 weeks; in the others more rarely. There was *no* reason to suspect retention of urine in any of these patients, and it did not occur to us at first that such was the probable explanation of the phenomenon. We regarded it as a sudden and temporary increase in the rate of urine secretion. Diuresis without dilution is unusual, and we therefore tried to reproduce it in these patients by various means—*e.g.*, by *giving* them strong tea; urea by mouth, both in small and in large doses; 100 mg. ephedrine hydrochloride orally; 1 mg. histamine subcutaneously. Our efforts were entirely unsuccessful. Subsequently exactly similar occurrences were observed twice in a patient who was found to have a urethral stricture. It was also recorded twice in a patient with no evidence of any renal lesion; a man with a gastric ulcer who was on a very fluid alkaline diet and who passed about 2500 c.cm. of urine a day. It therefore appeared that the probable explanation of all the cases was a failure to empty the bladder completely on one occasion, causing urine to be voided again after a smaller interval of time than customary. The prone position in which micturition takes place in bed may well be the sole reason for the incompleteness of the act, of which the patient is quite unconscious. No sex difference was apparent from our records. We consider that incomplete emptying of the bladder affords a rational explanation of the large difference frequently seen in renal efficiency tests done at short intervals on patients who are in a stationary clinical condition. This is the more likely since in renal efficiency tests the collection of small specimens is carried out at small intervals of time.

A RECORD OF AN ATTACK OF MANIA.

By L. C. Bruce, *M.C.*, M.D., F.R.C.P. Edin.,

MEDICAL SUPERINTENDENT, PERTH DISTRICT ASYLUM, MURTHLY.

The following case of acute mania (manic-depressive insanity) is interesting, first, because one rarely has the opportunity of seeing such an attack from the onset to the recovery, with a complete blood chart, and secondly, because it is still rarer to isolate an organism from the blood, which in this case gave a positive skin reaction.

The *patient*, a man of 40, had previously been in this hospital, suffering from an attack of melancholia with suicidal tendencies, from which he made a good recovery and had been discharged six months ago. He felt ill, and fearing another mental attack he placed himself voluntarily under care and was admitted on March 4th. On admission he looked flushed and anxious and he complained of mental confusion and an inability to sleep. Beyond a pulse-rate of 100 per minute and slightly exaggerated tendon reflexes he presented no marked physical symptoms.

March 5th: He slept very little last night and to-day was confused and constantly talking. 6th: *Did* not sleep at all last night and to-day was very excited and in a condition of delirium with vivid hallucinations of sight and hearing. 7th: Slept for two hours under the influence of paraldehyde. The delirium and the hallucinations continued.

The views of two surgeons who have had considerable experience with this form of anæsthesia may with advantage be quoted here. Milligan,[9] says:

> "Low spinal, or spinal anæsthesia limited to the sacral nerves, has advantages which render it of the greatest value for operations on the perineum. It is reliable . . . It is a controllable anæsthetic and has none of the disadvantages of the higher spinal anæsthetics. . . . The administration of the anæsthetic is simple and is quickly carried out. It is not unpleasant to the patient and is convenient to the operator if he is skilled in the technique. Anæsthesia is complete in two or three minutes. Apprehension before operation can be abolished by suitable injections. For hospital work it is ideal."

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9 1 „	88	103	9·7 „	64	105

* For all these observations the thinnest side of the tube was kept directly facing the electroscope.

N. Hobhouse[2] has mentioned a case in which a boy of 11 became left-handed as the result of right hemichorea, and developed a stammer.

In the history of No. 4, the two varieties of transition are exhibited consecutively, in a right-handed member of a family with strong left-handed tendencies. The question as to why the first was *not*, and the second *was* followed by stammer is a difficult one, and suggests various possibilities. It might be submitted that the change to left-handedness was facilitated by its coincidence with a latent hereditary tendency, or that the development of the stammer was conditioned to some extent by the emotional resistance which he experienced towards the return to right-handedness. On the other hand the sequence might perhaps be explained by the relative plasticity of the physiological centres at the time when the first transition was achieved.

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[2] Ibid., 1928, i., 1116.

MEDICAL SOCIETIES

NORTH OF ENGLAND OBSTETRICAL AND GYNÆCOLOGICAL SOCIETY.

THE last meeting of this society was held at Liverpool when cases and specimens were shown.

Prof. LEITH MURRAY showed a specimen of *Endometrioma of the Anterior Vaginal Wall.*

The patient was 43 years of age and had had one confinement followed by "septic poisoning," since when contraceptive measures had been adopted. Her only complaint was of excruciating spasmodic pain lasting all through the periods. On examination a flat plaque was found on the anterior vaginal wall occupying more than half its surface and stretching up to the cervix. This area was covered with retention cysts filled with blood. Cystoscopy revealed an inward bulge but no involvement of the mucosa. Removal was accomplished partly with scissors and partly by blunt dissection and unfortunately the bladder was opened. Though the opening was closed a fistula developed. There has been no recurrence of the growth and there has been a complete cessation of the dysmenorrhœa. Section showed the tissue to be a typical endometrioma.

Section through one of the linear pits on the surface, said Prof Murray, showed that the squamous epithelium disappeared at the edge. He considered this a possible implantation area.

Mr. N. L. EDWARDS (Derby) showed an *Endometrioma in an Abdominal Scar* following Cæsarean section.

The patient, aged 33. had had a Cæsarean section in 1923. In November, 1929, Mr. Edwards again delivered her by the same route through a left paramedian incision. A section of each tube was resected, the stumps were buried, and the right ovary, which was cystic, was removed. The scar discharged serum from the eleventh to the thirteenth day. Recovery was afebrile. Seen ten months later the patient said that she had noticed a blackish discharge from the upper end of the scar and that during the last seven periods there had been no pain. A small purplish nodule was found at the point of the discharge with the uterus adherent to the anterior abdominal wall behind it. This condition was confirmed when the nodule was excised two months later. At the same time the abdomen was opened and the uterus was removed by subtotal hysterectomy along with the remaining ovary which was now cystic and adherent.

The nodule showed endometrial tissue but no connexion could be found between the endometrium of the nodule and the uterus. Mr. Edwards thought that of the two probable theories of origin—implantation during operation and metaplasia of peritoneal endothelium—the second was the more likely in this case.

Prof. MURRAY described a *Dermoid Cyst of the Left Ovary* weighing over 29 lb., containing fatty balls and pellets.

The patient was a virgo intacta, aged 52, who had passed the menopause five years previously. She had been aware of the tumour for 15 years and at the time of operation the abdomen measured 73 inches at the level of the umbilicus. A 3-inch incision was made in the abdomen and adhesions to the anterior abdominal wall were swept away with the hand. Attempts at tapping having failed the cyst was incised and 5½ pints of greenish fluid containing several thousand fatty pellets was evacuated. These varied in size from a split pea to an almond, but seven were found almost completely rounded and much larger. The rest of the contents, consisting of a fatty pultaceous material, was expressed through the incision, the whole cyst being finally removed. The inner and outer surfaces of the cyst wall were smooth and the only suggestion of a germinal node was a linear thickening about 5 inches long. Examination showed this to be a channel lined by several layers of transitional epithelium with some suggestion of goblet cells. There was also a narrow layer of involuntary muscle-fibre. The sebaceous glands discovered were mainly situated round this area, as was also a hair follicle. Radiographic examination was negative. Some fine hairs were found in the fluid and in some of the balls examined. An examination of the fatty material showed a large proportion of free fatty acid and non-saponifiable matter which explained the fact that the fat was solid at body temperature.

Dermoids of this type, said Prof. Murray, were extremely rare and he thought that by its size this specimen was probably unique.

Miss RUTH NICHOLSON showed an *Unusual Tumour obstructing Labour.*

This was removed seven months after the patient had been delivered by Cæsarean section. Previous to this she had had four normal labours. On this occasion she was seen after she had been in labour for 28 hours with good pains. The head was still high and a mass was felt in the pelvis to the right obstructing delivery. A lower segment Cæsarean section was performed by Mrs. Dobbin Crawford during which the tumour was seen to be separate from the uterus, lying on the right side of the pelvis and retroperitoneal about the size of a kidney. The child's head showed marked moulding and a large caput. At the second operation the tumour was found to lie between the layers of the right broad ligament and shelled out easily. It had no connexion with the uterus. It now measured 3 by 2 by 1½ inches and microscopically proved to be a fibromyoma with a preponderance of muscle elements.

Mr. ST. GEORGE WILSON described a case of *Chancre of the Cervix.*

The patient, aged 48, a multipara, complained of smarting and irritation of the vulva with a copious, and occasionally blood-stained, offensive discharge of two months' duration. The cervix was enlarged and soft and bled on palpation. A diagnosis of carcinoma of the cervix was made and a piece of the growth removed for examination, after which radium was applied. Section showed lymphocytic infiltration and the Wassermann reaction was then found to be strongly positive.

Mr. Wilson said that the idea that chancres in this position were rare, which he had previously held in common with the older writers, had been proved erroneous by Anwyl Davies, of St. Thomas's Hospital venereal diseases clinic. He had shown that the cervix was the commonest site.

Dr. P. MALPAS gave a demonstration of the efficacy of gauze packing in the *Maintenance of Radium Containers in situ.* He showed a series of radiograms taken in each case, 4 and 22 hours after insertion of the radium. They showed no alteration of position. The variety in the distribution of the containers in different cases according to the shape and extent of the growth was illustrated, and Dr. Malpas suggested that a large number of different appliances would be required to meet every case.

Blood culture.—35 c.cm. of blood were taken from the median basilic vein and distributed between four flasks of nutrient broth.

March 8th: Still labouring under delirium, but he had several short lucid intervals. 9th: He had four hours natural sleep last night, but even when sleeping he constantly talked just as if he was in a condition of mania in his sleep. 10th: A very definite mental improvement. 11th: Steady mental improvement. 12th: Now sleeping well and mentally clear but exhausted and easily tired. 16th: Practically recovered.

He went home on March 18th.

Bacteriological findings.—A very spare growth of short streptococci was found in each of the four flasks. The growth was pure in flasks Nos. 2, 3, and 4. The first flask was contaminated with staphylococcus. No subcultures could be obtained from the streptococci.

A vaccine made by adding 5 c.cm. of the contents of flask No. 2, mixed with an equal quantity of a 0·5 per cent. carbolic acid solution in normal saline was used as a vaccine to test the skin reactions. The patient gave a very strong positive. The controls were as follows: all volunteers, one from the hospital staff, were negative. Five cases of manic-depressive insanity in the condition of depression were all negative. One case of manic-depressive insanity, chronic, but at that time passing through a mild maniacal attack, gave a slight positive. Two cases of long standing manic-depressive insanity in a condition of remission: one gave a negative and the other a very faint positive. Two cases of encephalitis lethargica, two cases of dementia præcox, and one of delusional insanity, all were negative.

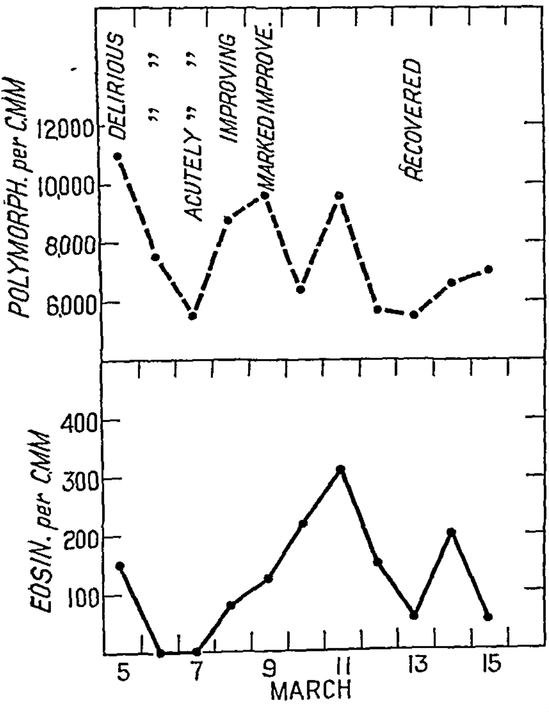


Chart showing variations in the polymorph and eosinophil leucocyte count in relation to the patient's clinical condition.

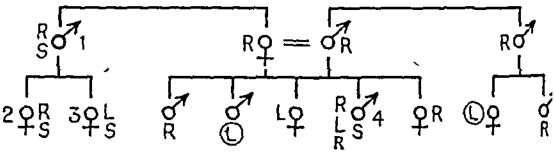
The accompanying chart shows a fall of the polymorphonuclear leucocytes at the period of acute delirium, and a rise on recovery. The eosinophil leucocytes, it will be noted, disappeared altogether from the blood count during the period of acute delirium, reappeared again as improvement commenced, and increased as recovery became complete.

AN UNUSUAL COMBINATION OF LEFT-HANDEDNESS AND STAMMER.

BY LOIS MUNRO, M.B. LOND.,
LATE CLINICAL ASSISTANT, WEST END HOSPITAL FOR NERVOUS DISEASE.

THE following family history seems worth recordin because, while it exemplifies the well-known relatio between left-handedness and stammer, it also contain features which are decidedly unusual.

Four living members of the family stammer No. 1 (see Chart) states that he has stammered sinc he began to speak; he has been right-handed all hi life and remembers no left-handed tendencies. Nos. and 3 are his only children (both daughters); of thes No. 2 resembles her father in each particular, and No. has always stammered but has been left-hande since infancy.



R = right-handed; L = left-handed; L in circle = left-handed tendencies; S = stammer.

A sister of No. 1 (deceased) was normal in speec and was right-handed, as is her husband. A niece c the latter states that she has an inclination to us the left hand, which she overcomes voluntarily; sh also draws from right to left. Of the five childre of the normal pair referred to the first and fifth ar normal in all respects. The second has slight lef handed tendencies. The third is left-handed an normal in speech. In the fourth (No. 4) the sequenc of events was peculiar and raises points of considerabl interest.

The family circumstances were such that No. during his first seven years was looked after almos entirely by his sister, although she was only a fe years older than he. She was firmly convinced tha her own left-handedness was normal, and admit that she regarded her young brother's right-handednes as reprehensible. Accordingly under her influenc the function of writing was firmly established in th left hand by the time when he went to school, at th age of seven. There his mancinism met with uncom promising opposition on the part of the schoo authorities, and within a short time he had acquire the habit of writing with his right hand during schoo hours. During the same period he continued to us the left hand when at home, and at the end of a yea of this régime he had developed a severe stamme It appears that he submitted without resistance t the change from right to left, but strongly resente the return to right-handedness. Now, at the age c 17, he writes with his right hand, but uses his lef hand for other purposes. The stammer has persisted

The causal relationship between thwarted left handedness and stammer has been well recognise since the appearance of W. S. Inman's paper.[1] Th question as to whether stammer may also be occasione by diversion from the right to the left hand has no been established so conclusively, since the oppor tunity of observing this sequence rarely occurs Inman referred to one case in which stamme originated in this way, and to Hugh Gordon's serie of epileptic children at Lingfield Colony schools of course, acted upon by the ovarian substances; this fact is sometimes lost sight of when the actions of these hormones are considered clinically. The growth-producing hormone of Evans is often looked on as associated with, if not similar to the prolans secreted by the anterior pituitary. Prof. Zondek concludes that they are not only distinct but have even some sort of small antagonism in their times of action. His statement that the pituitary hormones of man and beasts are not identical with the corresponding secretions of birds and cold-blooded animals has great biological interest in its indirect bearing on many contradictory experiments on lower forms. The well-known Aschheim-Zondek test for pregnancy is dealt with fully, and some unpublished results are brought forward. The clinical applications and indications of the subjects are discussed, and their association with various cysts and growths of the genital tract are described.

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[1] THE LANCET, 1924, ii., 211.

This book should be studied alike by clinicians, pathologists, and physiologists.

The Mind in Action.

By A. CAMPBELL GARNETT, M.A., Litt.D., Professor of Philosophy in Butler University, Indianapolis, U.S.A. Contemporary Library of Philosophy. London: Cambridge University Press. 1931. *Pp. 226. 5s.*

Dr. Garnett deals with his subject from the point of view of motive and value, and admittedly derives his psychological standpoint from James Ward and William MacDougall. He is particularly indebted to MacDougall for the latter's Theory of Instinct and Emotion which, however, he does not adopt uncritically or entirely. As regards intelligence in its relation to motive, he is substantially with Prof. Spearman in his acceptance of the general factor. The main burden of the book is to establish the relationship of fundamental motives with sentiments and the growth of the moral self, and the author's view of beauty and truth is that they are the results of a type of harmony which the fundamental processes of mind impose. This is an attractively written book with a bent towards the introspective rather than the experimental method in psychology.

Accidental Injuries.

By HENRY H. KESSLER, A.B., M.D., F.A.C.S., F.A.P.H.A., Medical Director, New Jersey Rehabilitation Clinic. London: Henry Kimpton. 1931. Pp. 71 45*s*.

UNFORTUNATELY medical evidence in a court of law has not always the quality of detachment, but is partisan in nature. This regrettable fact is due amongst other causes to the absence of standards by which the medical witness may assess any given disability, and to ignorance of the prognosis of injuries and diseases. Where such defects of knowledge exist, bias can hardly be avoided. Much useful information to guide the practitioner who is called upon to give evidence in a court of law is provided in Dr. Kessler's book, which will also help him in his examination of the patient. The material collected within its covers is gleaned partly from the study of upwards of 63,000 cases coming before the New Jersey Compensation Bureau, and partly from a comprehensive search of the literature dealing with this aspect of disease. The early chapters treat of the general pathology of injuries, the bad results which may follow them, and the principles on which disabilities can be assessed. Separate chapters are then devoted to the different regions of the body. Traumatic neuroses and occupational diseases have sections to themselves, the latter including industrial poisoning. The last chapter supplies a most interesting account of the rehabilitation of the physically handicapped.

This book will help all who may be called upon to give evidence in connexion with injuries.

Lehrbuch der Röntgenstereoskopie.

By Dr. MAX COHN, Medical Director of the X Ray Department of the Friedrichshain Hospital, Berlin; and Dr. WALTHER BARTH, Physicist to the Agfa Company. Leipzig: Georg. Thieme. 1931. Fully illustrated. Pp. 324. M.30; M.35 bound.

IN 1867 Helmholz published the work which laid the foundation of physiological optics, and so it is not surprising that the majority of the 300 authors mentioned in the bibliography attached to this textbook of X ray stereoscopy are German. The theoretical and practical sides of X ray stereoscopy are fully dealt with, and an accompanying atlas of 26 reproductions of X ray photographs is excellent.

The authors deal seriatim with the difficulties that arise in the application of stereoscopy to X ray work and lead their readers step by step through the increasingly difficult geometrical conception involved. Deploring the scarcity of works on the technique of stereoscopy, the earlier workers having confined their attention to the morbid conditions, they find that the introduction of the mechanical tube and cassette movement has opened up new fields. Their astonishment is frank that there should remain prominent medical men antagonistic to the use of the stereoscope; an astronomer, skilled in the use of the stereo-micrometer for the measurement of the mountains in the moon, might similarly find it hard to believe that there should exist people so unprogressive as to contemplate that orb as it appears to the naked eye, but time has to elapse before new scientific methods become of general use, and they may be reminded that the general adoption of the ophthalmoscope did not occur until 30 years after its description by Babbage.

The introduction by Dr. Max Cohn deals with the value of the stereoscope as a means of research, instruction, and clinical diagnosis, and the same author is responsible for the atlas which is issued with a collapsible stereoscope of suitable size. The remainder of the work is divided into two parts. Part I. by Dr. Barth and Part II. by Dr. Cohn. Part I. contains five chapters on theory grouped under headings such as Subjective and Objective Stereoscopy, and Radiostereometry. In Part II. the author deals firstly with the historical and technical development of stereoscopic photography, and then with the application of these methods in diagnosis, and the relative and absolute indications in surgery and internal medicine for their employment. He deals with the localisation of foreign bodies and follows with a description of corporeal representation of the skin in the X ray picture. A section deals with the extremities, another with the skull including fractures, cerebral tumours, foreign bodies, with paragraphs on the ear, the jaws, and the orbit, and a third with the pelvis and vertebral column, the thorax, the abdominal organs and obstetrics generally. The text is illustrated by two plates, 193 diagrams, and reproductions of photography and skiagraphs. Plate I. gives a stereoscopic diagram and a stereoscopic X ray photograph with movable images and indications of the correct, and four possible incorrect, positions of the image, so that the reader may observe

REVIEWS AND NOTICES OF BOOKS

Chemical Embryology.

By JOSEPH NEEDHAM, M.A., Ph.D., University Demonstrator in Biochemistry, and Fellow of Gonville and Caius College, Cambridge. London: Cambridge University Press. Three volumes. 1931. Pp. 2021. £5 5s.

THERE are over 2000 pages in these three volumes, and a rough idea of the scope may be gathered from the fact that the bibliography begins on p. 1727 and ends on p. 1968. An erudite work of exceptional merit, it is presented in classical style; a portrait of Harvey appears on the page facing the title page, and there follow a Latin dedication and two quotations, one from William Harvey's "Anatomical Exercitations," and the other from one of the works of Joseph Glanville. After the prolegomena the author opens with Part I., entitled The Theory of Chemical Embryology. This is composed of some 30 odd pages dealing with the general philosophic consideration of generation and embryology. Dr. Needham develops his theme in a skilful manner, reviewing briefly the views of the older philosophers who meditated on these problems. His survey concludes with a significant quotation from S. T. Coleridge: "The history of a man for the nine months preceding his birth would probably be far more interesting and contain events of far greater moment than all the three score and ten years which follow it." This doctrine may have inspired Dr. Needham in sacrificing so much intense labour to the production of his great work.

Throughout the first section the author indicates that he is not satisfied with the purely histological and morphological methods of approach, and this attitude is progressively shown in Part II., which is entitled The Origins of Chemical Embryology. From the general reader's point of view this section of the book is undoubtedly one of the most interesting. The description of early Egyptian incubators for hens' eggs reveals many curious methods for maintaining a constant temperature. Dr. Needham takes us through various periods in the world's history, gives references to the Hellenic outlook on embryological problems, traces embryology through the Roman period to Galen, and, not content with the more classical sources of information, he proceeds to a careful review of the Arabian and Jewish literature of very early times. The references to the work of Leonardo de Vinci are illuminating. The facsimile of a page of one of the famous "notebooks" dealing with embryology is curious; the accuracy of Leonardo's observations on this problem is remarkable. As Dr. Needham says "here Leonardo touches on one of the most modern quantitative aspects of embryology, and one almost expects him to exemplify his words with a graph until one remembers with a shock that he lived two centuries before Descartes and five before Minot." The section concludes with an admirable summary of the development of embryological science from the seventeenth century to the present day. Dr. Needham's admiration for Harvey has betrayed him into devoting so much space to extracts from his works that his references to other observers have been disproportionately curtailed. The exposition in greater detail of the views on embryology of Sir Thomas Browne and of Descartes, for instance, would have been welcome.

With Part III. the actual chemical work begins. This and the subsequent matter provide a complete and scholarly account of the biochemistry and physiology of developing eggs. The author has a sharp critical faculty and thus the book is no mere catalogue of facts, but a readable and helpful guide by a leader who knows the way. It may be recalled that it was in connexion with inosite that Dr. Needham's name first became known in the biochemical world; it is thus interesting to read a statement from him on the metabolism of this substance and its derivatives. In the section on carbohydrate metabolism the bibliography is of special value and Dr. Needham deals fully with the application of the modern methods, such as those of Otto Warburg, in the study of this problem. We would have welcomed a fuller description of the author's views on the part played by hormones in the developing embryo. The summary given indicates the great importance of this subject, but in certain places he has been too kind to some of the authors to whose work he refers. In subsequent editions this section will doubtless be extended, a remark which applies also to the section on pigments in the course of development.

This is a great work and should be bought by every institution which can afford to buy it, since it is only by this practical form of encouragement that such a book can be kept alive in new editions. The value of the production from every point of view is so high that it should find a place in every biochemical or physiological library.

Die Hormone des Ovariums

und d. Hypophysenvorderlappens. By Dr. BERNHARD ZONDEK, A.O. Professor in the University of Berlin. Berlin: Julius Springer. 1931. Pp. 343. R.M.40.

WITHIN the last ten or twelve years the anterior lobe of the pituitary has assumed a more definite and forceful rôle in human biology than before. This part had been known for a considerable time as having marked influence on growth, and certainly had been used by clinicians in tentative and empirical ways, but in 1923 definite experimental evidence of a "growth-producing hormone" derived from the anterior lobe was brought forward by H. M. Evans. Aschheim and Zondek, some five years ago, widened the field of action by demonstrating the production by the hypophysis of hormones which did not act appreciably by themselves, but through their effect on other hormone-producing organs. In these researches on the biology and clinical conditions of the female genital functions, Prof. B. Zondek brings together the principal investigations on the subject, including some unpublished work. He has been studying these hormonal actions since 1913, and this contribution to the literature is authoritative. The intricate subject is handled in a simple way. There are no sterile protocols or calculations to exhaust the attention; the results attained are shown shortly and their import explained.

The author opens with discussion of the methods of investigation, and gives details of operative and experimental processes, including the examination of changes in vaginal smears. He passes step by step through the maze of effects of ovarian hormone, as seen in castrated and infantile animals, to the greater intricacies of the action of the hypophysial secretions. The quantitative nature of these seems evident. The absence of pituitary action in castrated animals is clearly shown, though these animals are,

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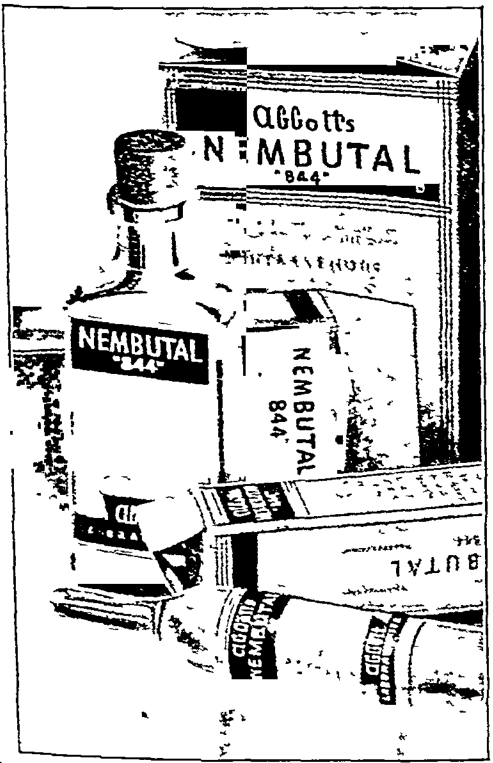

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for himself the results of error. Plate II. illustrates the localisation of a foreign body. A table of data, determined by experiment, gives the limits of accuracy of accommodation and convergence over various distances.

The book is easy to follow, for the authors have spared no pains to illustrate their points in logical sequence, in order, as they say, to convince the sceptic. It is doubtful, however, whether X ray stereoscopy can be generally adopted, even with this work at the disposal of the radiologist.

Of the value of the technique in the hands of such experts as the authors there can be no doubt. It is the unlucky fact that at the present moment the book costs in English money 48*s.* 6*d.*

A Text-book of Physical Education.

By JESSE FEIRING WILLIAMS, M.D., Professor of Physical Education, Teachers' College, Columbia University; and WHITELAW REID MORRISON, M.D., Professor of Hygiene and Physical Education and Director of the Men's Gymnasium, Oberlin College. London: W. B. Saunders Co., Ltd. 1931. Pp. 343. 12*s.* 6*d.*

THE authors of this book in their preface lament the fact that the facilities for physically educating boys and girls are far removed from the comprehensive measures embodied in technical and academic education. Such a plaint from American professors of physical education sounds strange to us, in view of the contrast between the elaborate systems known to exist on the other side of the Atlantic with the casual haphazard procedure with which we are familiar in this country. It is of course arguable that undue emphasis is placed upon the need for study of what is only a subordinate feature in school and university life; and it must be a matter of opinion to what extent it is desirable to attempt an intellectual campaign on this subject among the students themselves, as the authors hold to be desirable. In this country we think rather in terms of the therapeutic and corrective, and regard these as the province of the medical profession. In numerous quarters the part played by recreation and competitive athletics in our schools and colleges is already considered to be rather too great, and a policy which insists upon exercise as a systematic part of the curriculum would meet with severe criticism. On the other hand, a higher degree of physical, mental, and social fitness might arise if young people were made to take an intelligent interest in the physical activities that play so large a part in their lives, and it is at least a plausible argument that attention should be paid in the selection of the most suitable form of exercise having regard to the future career of the student—whether a sedentary, professional, or commercial life or a physically active career is in prospect. To all those with views on this subject this readable book should make an appeal.

After a historical introduction the authors proceed to enunciate anatomical and physiological principles in some detail, yet in language intelligible to the layman. These sections are followed by a discussion on strenuous exercise, with advice on training along common-sense lines. A chapter on injuries and minor ailments is unexceptionable though the enthusiastic insistence upon the possibility of overcoming certain physical defects by set exercises is perhaps too optimistic. An address on Longevity by Sir Farquhar Buzzard is quoted in approval of the rôle of "the understanding spectator" unable himself to participate in violent muscular exertion, and a chapter on "How to Read the Sport Page" is appended to educate the ignorant and inexperienced in the essentials, the technical details, and some of the jargon of the sporting journalist.

This book can be recommended as an authoritative and comprehensive manual on the subject. It is illustrated with action photographs which admirably fulfil the function proper to such illustrations.

Infant Feeding in General Practice.

By J. C. V. BRAITHWAITE, M.D., M.R.C.P., Physician in charge of Children Out-patients, Leicester Royal Infirmary and Children's Hospital. Bristol: John Wright and Sons, Ltd. Pp. 140. 4*s.* 6*d.*

THIS book is written by a general practitioner who is brought into close contact with problems of the home and of the management of parents. The chapter on the routine of breast-feeding and its difficulties contains much valuable practical advice. For artificial feeding Dr. Braithwaite recommends simple dilutions with added carbohydrate as the method of choice, and gives a clear account of the indications for varying this method. The latter part of the book deals with nutritional disorders of infancy, and contains an intelligible summary of the essentials of the theories of Czerny and Finkelstein. This book is thoroughly sound and should be of distinct value to the author's fellow practitioners.

Quatre cents consultations médicales.

Pour les maladies des enfants. Ninth edition. By Dr. JULES COMBY, Médecin Honoraire de l'Hôpital des Enfants-Malades. Paris: Masson et Cie. Pp. 551. Fr.36.

THE ninth edition of this book is larger than its predecessors and covers the whole range of children's diseases, medical and surgical. It is arranged alphabetically, a brief synopsis being given of the clinical features of the condition referred to, with the lines of treatment recommended. Prescriptions are set out in detail. As a book of reference for treatment, particularly of emergencies, this book should continue to fulfil a useful function.

Analyses médicales pratiques.

By RENÉ CLOGNE, Ex-Chef de Laboratoire à la Faculté de Médecine de Paris; Docteur en Pharmacie de L'Université de Paris, Lauréat de l'Académie de Médecine. Paris: Librairie Le François. Pp. 472. Fr.32.

THIS book was written for the purpose of providing a simple account of the methods of performing chemical analyses in the laboratory. A detailed description is given of each test and also a list of the necessary materials and of the figures normally obtained. Mostly the methods described are not those used in England or America and in some respects the book is old-fashioned. The author has included in this third edition two new chapters one on bacteriology and the other on parasitology, where the more common types of bacteria are discussed and the media in which they may most easily be discerned. In other respects the book does not differ materially from its former editions.

Erratum.—In the article on the Significance and Value of Examinations of Milk by Dr. Thomas Orr which has recently been reprinted from THE LANCET and published in Vol. II. of the collected articles on Clinical Interpretation of Aids to Diagnosis, the minimum figure for non-fatty solids in milk allowed by the Sale of Milk Regulations, 1901, should be 8·5 and not 8·7 (pp. 127 and 129).

THE LANCET.

LONDON: SATURDAY, JANUARY 9, 1932.

WOMEN AND NATIONAL HEALTH INSURANCE.

THE third quinquennial valuation of approved cieties made by the Government Actuary. Sir FRED WATSON. under the terms of the National ealth Insurance Act. 1924. which was summarised in THE LANCET of Dec. 26th. reveals a squieting state of affairs and raises problems of eat medical importance. Since the second valuan in 1923. a satisfactory aggregate surplus has cumulated. but the solvency of certain sections the scheme (a matter which touches the interest every citizen) is gravely jeopardised by certain ctors which have assumed unexpected importce. The survey covered 7600 approved societies d branches and an insured population of .380.143. of whom 5.427.121 were women. Of ese societies 7001 showed surpluses. the average rplus per member being £2·41. In 189 societies. ith a membership of 435,869. the assets and bilities were equal. In 418 societies and branches e deficit was £847,667, or an average of £1·17 r member.

This not unfavourable general picture is marred the unsatisfactory state of the women's societies. was pointed out at the second valuation that e women were making much heavier demands on e sickness and disablement funds than the men embers. and as a consequence of this warning paration has taken place to such an extent that 2 per cent. of the insured population are now nrolled in societies restricted to one sex only. t is now shown that in units insuring men only he average surplus is £2·76 per head. whereas the women's societies the corresponding figure £1·11, the "total retrogression" of the funds such societies since the last valuation amounting to £640.000. Further. the men's societies have en able to give valuable additional benefits o 88 per cent. of the male insured population, and he women's societies to only 38 per cent. of omen. Even this proportion cannot be maintained in the future. The reason for the disrepancy is simply explained, by the fact that the ickness and disablement claims of women are verywhere in excess of those made by men. and n the case of married women (who constitute 21 per cent. of the whole). grossly in excess. Between 1923 and 1927 there was a general rise in sickness laims. doubtless explained mainly by the economic ituation: the men's claims rose by about 13 per ent., but the single women's claims increased by 29 per cent.. and the married women's by 42 per ent. In the case of disablement benefit the respective increases were 54 per cent. and 87 per cent. respectively. The position is growing more serious as the proportion of women is relatively increasing: the costly married woman worker tends to stay longer in insurance. The insured population shows a gain of 10·3 per cent. of men, 10·9 per cent. of single women. and 23·8 per cent. of married women since the last valuation. In estimating future claims the Government Actuary has been compelled to allow for 25 per cent. more weeks of sickness benefit and 65 per cent. more weeks' disablement benefit for single women than for men. and for the married women 140 per cent. more sickness benefit and 60 per cent. more disablement benefit than for men. Taking both benefits together the cost provided is 60 per cent. more for all women than it would have been if the male rate of sickness and disablement had been applicable.

The report does not deal with the medical aspects of the situation. and evidently regards the great excess of liabilities incurred by the female worker as a permanent and possibly increasing factor in the situation. There is. however, a strong case for further investigation before this attitude is accepted by the medical profession with complacency. That a certain balance will pile up against the woman worker is apparently inevitable. It is well established that all investigations show a higher sickness-rate for women than for men in industry. Even among the professional classes the data, though scanty, point in the same direction. In a valuable study of "The Sickness Data of Elementary School Teachers in London. 1914–1919." by Mr. J. Y. HART. B.Sc.,[1] it was found that "sex was the most important factor in the illness of teachers. The mean illness of men teachers was 4·6 days a year for the period 1914–19. and the corresponding figures for single women and married women are 8·2 and 9·3 respectively." A further study of the causes and incidence of permanent disablement in teachers[2] showed that one woman teacher in 194 retired disabled. and one male teacher in 525; in other words. that a woman teacher is more than twice as likely to retire on health grounds as a man, but the risk is not in either case serious. Even with these known results of investigation before us the findings of the National Insurance Report are startling and disappointing. Modern education and training in hygiene had. it was commonly supposed. wrought an immense improvement in the health of this generation of young women. The reports of the elementary school medical service show a steady record of improvement. and the athletic triumphs of women in every field they have entered suggest a rising rather than a falling standard of physical efficiency. Nor does ordinary clinic experience suggest that the young woman of to-day in any class is a physical weakling. Within recent years certain diseases such as chlorosis and dysmenorrhœa have practically disappeared as a cause of periodic disability in

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[1] Journal of the Royal Statistical Society, 1922.

[2] London County Council School Medical Officer's Annual Report, 1929, p. 86.

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culiar value in this country and in others where e specimens would not have been obtainable in rge numbers, because the spine may not be moved from bodies at autopsy.

The intervertebral disc is regarded by SCHMORL consisting of three parts, the nucleus pulposus, e annulus lamellosus, and the cartilage plate. he annulus lamellosus is arranged in a series of rong fibrous rings arising from the matrix of the rtilage plate and inserted in various points round the rim of the vertebræ, and is attached ith particular strength to the anterior longitu-inal ligament. It serves to resist tension and rsion, and acts as a capsule to the nucleus pulposus. This nucleus is a gelatinous mass, being a mnant of the notochord, and is under great ressure. Its function is to distribute weight, to ct as a shock absorber, and to be a pivot around hich all the movements of one vertebra on another akes place. The cartilage plate covers the per-rated area of the articular surface of the vertebral odies, and its function is to resist pressure and rotect the spongy bone. Taken as a whole the tervertebral disc is like a powerful spring cushion, here the tension of the spring depends upon the xistence of the outer cover; if this happens to ive way the tension within is reduced. As might e expected, therefore, the resistance of the carti-age plate, when healthy, to all kinds of injurious nfluences, both infective and traumatic, is very reat. When discussing the histology of these artilage plates Dr. BEADLE points out, however, hat in more than half the cases examined fissures an be seen running right through the substance f the plate into the bone; the conclusion drawn s that though normally very resistant, these lates are particularly prone to degenerative hanges, accentuated no doubt by repeated minor njuries during the course of a normal active life.

The practical importance of these fissures is hat they allow the substance of the nucleus pulposus gradually to prolapse through into the spongy bone. This observation was first made by SCHMORL in 1927, and the condition is found in bout 38 per cent. of the spines examined. The ge-incidence of these nuclear prolapses is interesting. Between the ages of 18 and 59 they are manifest in 40 per cent. of male and 20 per cent. of female subjects. In subjects over 60 this percentage is almost reversed, being 23 per cent. for male and 44 per cent. for female subjects. The interpretation placed on this curious change in incidence is that after the retiring age for men women continue their arduous household duties, and inflict a series of mild traumata on their degenerating cartilage plates which tends to produce in them, at a later age, the condition which is commoner in men before the age of 60. In young people reactive changes occur producing an area of sclerosed bone around the prolapse which offers a resistance to its further progress. But in the aged, where bone-forming processes are less active, inflammatory changes occur and the granulation tissue destroys the prolapsed nucleus, and even extends into the disc itself. In this way the disc gradually becomes converted into non-resilient fibrous tissue; when this takes place all shocks are transmitted from bone to bone, and osteophytic lipping occurs.

These observations on nuclear prolapse are of particular interest in connexion with adolescent kyphosis, a condition which in this country is usually regarded as being due to vertebral epiphysitis. According to Dr. BEADLE, when growth is still active, unless pressure changes are evenly distributed over the whole surface of a vertebra, the constant assumption of an attitude such as bending over books, or some manual occupation, tends to lead to alteration in the shape of the bone according to the well-known laws of bone growth. This alteration does not happen in the spine of a healthy child, because the intervertebral disc is so flexible as to enable it to distribute pressure over the whole surface in a perfectly uniform way, in whatever position the vertebræ may lie. The nucleus pulposus also has a distributing function of this kind, but if this nucleus has prolapsed into the bone it cannot fulfil this function. Consequently greater weight is borne anteriorly than posteriorly, with the result that eventually the vertebræ becomes wedged-shaped. In such cases the primary cause of the prolapse may be a congenital one, but Dr. BEADLE quotes the opinion of SCHEUERMANN [2] that the beginning of a kyphosis may sometimes be traced back to a bout of hard work, and suggests that in some cases there may be an abnormal vulnerability of the cartilage plate rendering it liable to become fissured by repeated slight traumata, and so to allow the nucleus pulposus to prolapse. The presence of a prolapse does not of itself produce kyphosis, but the combination of prolapse with the constant assumption of one attitude, either during work or play, at a time when the vertebræ are actively growing, may, it is held, give rise to the clinical picture of adolescent kyphosis. If this sequence is accepted, it follows that for certain children arduous sports should be prohibited, though it is not clear how those who are specially liable to early degenerative changes in the disc could be recognised. The thesis of this work is that this tendency is far more common than is generally supposed. The assumption of the erect attitude is a relatively recent event in the history of evolution, and the spine is still showing a reluctance to adapt itself to its altered position.

The beautiful plates which illustrate this monograph are certainly convincing, and it seems likely that Prof. SCHMORL has opened up a new line of investigation which may be followed with profit. The conclusion drawn from his studies of spinal deformity by Dr. BEADLE is a conviction of the paramount importance of the intervertebral discs in the preservation of the normal form of the spine during the infinite changes of shape, compressions, extensions, and torsions it undergoes in functional life. The severity of the strain they have to bear leads them to yield to senile changes long before these appear in other tissues; and where these changes have occurred, the spine becomes stiff and permanently deformed.

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[2] Zeitsch. Orthop. Chir., 1920, xli.

training colleges, nurses' homes, and factories. It is indeed incredible that preventive medicine has done nothing, or can do nothing more to close the gap which still yawns between the physical efficiency (measured in terms of sickness-rate) of men and of women in industry. Even in an age when commissions and committees of inquiry have been overdone, it might be sound economy to inquire more deeply into the precise nature of the excess of sickness in women, and whether it is in fact being prevented by the welfare work and improved hygienic conditions which obtain to-day in certain factories and offices. The experience of the Ministry of Munitions and the women's services during the war certainly suggested that the health of women workers was susceptible to improvement under good conditions.

Leaving aside the possibilities of reform in the future, the situation to be faced by the approved societies is undoubtedly grave, and Sir ALFRED WATSON strongly urges the application of two remedies. He suggests that the separation between male and female insured persons should be "still further developed" in order to "correct the injustice to male members." He further demands that the contributions of women members be increased or that their benefits be reduced to bring the finances of their societies on to a sound basis. The necessity for some such measure is obvious, but as has recently been pointed out[3] it is by no means clear why the single women should have to bear the entire burden of the married women's excess claims. If the young married woman worker constitutes a serious drain on the funds of her society, it is no doubt partly because of sickness and minor disabilities associated with pregnancy, which are singularly difficult to check. There are many days or even weeks in the course of a perfectly normal pregnancy when a woman is genuinely unfit to turn out in the early morning or to keep on her feet all day, although she is quite able to get through ordinary household duties in her own time; no system of medical certification can protect funds effectively against these extra claims. Moreover, the married woman is apt to have a double burden of household duties in addition to her industrial work, which may prove a serious physical strain on the less robust women. Most difficult to assess, but possibly most important of all, is the undeniable fact that for obvious reasons it is more often to the interest of the married woman to stay at home than it is for the man or the single woman. The "psychological moment," in the proper sense of that much-abused term, tends to push the insured married woman into invalidity. That this is not due to a peculiarly feminine failing but to a universal human weakness is frankly recognised by the *National Insurance Gazette*, which points out: "No health or unemployment insurance scheme can do any good with members or policy-holders who prefer to be claimants. It is an elementary principle in insurance. No fire insurance company would knowingly issue a policy to a person who preferred to have a fire." In equity it would thus appear that if the married woman worker is to be grouped with any other class it should be with the married men. For such part of the excess claims as is due to pregnancy they are surely responsible rather than the single women, and where the excess is caused by excessive devotion to home interests presumably they and not the single women reap the benefit. Administratively it may be more convenient to group all the women together, but it is bad administration to penalise a class unfairly for the convenience of administrators.

The report leaves the strong impression that there is much to be said for the suggestion, often advanced by insurance experts, that married women should be taken out of the insurance scheme altogether, and should constitute a special group of "exempted persons." Their health is of especial concern to the nation and should be adequately provided for, but not by a scheme which encourages wasteful claims, and threatens other classes of workers with unjust curtailment of benefits or financial ruin. It has been necessary to reconsider seriously the position of married women under the Unemployment Insurance scheme, and the time has come when in the interests of the nation it appears equally necessary to readjust their position in regard to National Health Insurance.

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THE FUNCTIONS OF THE INTERVERTEBRAL DISCS.

IN this country the work of Prof. GEORG SCHMORL, of Dresden, on the pathology of the spine has not received the recognition it deserves, though in France, mainly through the efforts of J. CALVÉ and M. GALLAND, the importance of his observations has been widely appreciated.[1] Since 1923 Prof. SCHMORL has collected some 7000 whole spines, and the conclusions he has reached from the detailed study of this material as a whole and of the vagaries of the intervertebral discs in particular are extremely instructive. Dr. O. A. BEADLE, while holding the Radcliffe Travelling Fellowship for 1929–31, has been working with Prof. SCHMORL, and has just published, under the auspices of the Medical Research Council, a report on the intervertebral discs embodying observations on their normal and morbid anatomy in relation to certain spinal deformities.[2] Dr. BEADLE points out in his introduction that though the results of the anatomical researches carried out in the pathological department of the Friedrichstädter Krankenhaus at Dresden have been published in a scattered way in various German journals, no connected account has appeared in any language of the interpretation placed on these results by those actually working in the department. This report is a first-hand description of specimens actually seen and handled by the author, and is not a mere summary of SCHMORL's publications. It has r Cecil Levita, late chairman of the London County uncil, who become K.C.V.O.; and among new ights, Mr. Halley Stewart, founder of the trust nd called after him, and Prof. Patrick Geddes, the teran sociologist. In the world of nursing, Annie dy Cowdray is appointed G.B.E. in recognition of r long work and many benefactions, while lesser nk in the same Order is conferred on the superinndent of the Queen's Institute of District Nursing, iss A. M. Peterkin, and two matrons of English ental hospitals, Miss E. E. Gardner and Miss A. J. ichardson. Sister F. M. D'Exeter, of Queen lexandra's Royal Naval Nursing Service, receives the .R.C., and Mrs. Katherine Cook, of Uganda, is romoted to be O.B.E. To all these and others hom we have not mentioned in this place we offer earty congratulations.

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[3] National Insurance Gazette, Dec. 26th, 1931, p. 619.

[1] See THE LANCET, 1931, ii., 697.

[2] Medical Research Council Special Report Series No. 161. H.M. Stationery Office. Pp 79. 2s

OBESITY AND WATER BALANCE.

CLINICIANS tend to be somewhat fatalistic about obesity, to assume that the fat person will continue o wax fat even when his food intake has been reduced below the normal maintenance level. A paper by L. H. Newburgh[1] helps to explain the origin of this superstition. Deposition of fat can only take place in one of two ways—either by diminished katabolism of issue fat, or by increased assimilation of the fat supplied by the diet. Concerning the first possibility there is no evidence that oxidation of fat is deficient in cases of obesity. Indeed, W. M. Boothby and I. Sandiford[2] have shown that the basal caloric output, per square metre of body surface, is normal in obese patients. If the caloric expenditure is normal, it follows from elementary physical laws that restriction of the caloric intake below minimal requirements must cause a loss of flesh. A loss of flesh, however, does not necessarily imply a loss of weight, and much of the prevailing confusion of ideas is due to failure to realise the importance of water balance in relation to changes in body-weight. The clinical determination of water balance is one of the most difficult problems in experimental medicine. Mere comparison of fluid intake with urine output is valueless, except in cases of gross œdema. Most solid foods contain a high proportion of water and the body also gains water from the combustion of the hydrogen of the assimilated foods. On the other hand water is lost, not only through the kidneys, but also in a large measure through the skin and lungs and the intestine. In his studies of obesity, Newburgh has measured these various fractions by intricate methods, and finds that a diet inadequate in caloric requirements always causes a loss of flesh, but that this loss may sometimes be entirely masked by coincident retention of water. He concludes that there is no specific metabolic abnormality in obesity and that all obesity is therefore "simple" obesity, indicating a failure of the primitive instinct to adjust the inflow of energy to bodily needs. He reminds us that, while an obese patient may, in all good faith, deny that he overeats, close cross-examination will often show that he is confusing food bulk with food value.

While Newburgh's work helps to clear away some misunderstandings, it does not offer a complete explanation of obesity. It may be, as he suggests, that the overnutrition is usually due to unconscious habitual overeating. Yet it would be unwise, in the absence of further evidence, to ignore the possibility that primary derangements of such organs as the pituitary and the hypothalamus are to some extent to blame.

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[1] Jour. Amer. Med. Assoc., 1931, xcvii., 1659.

[2] Jour. Biol. Chem., 1922, liv., 783.

A GUIDE TO THE ACTIVITY OF RHEUMATIC INFECTION.

THE importance of the sedimentation rate of the red cells as an indication of the presence or absence of active infection has long been recognised. Almost immediately after the introduction of the test by Fahraeus it was adopted as a means of following the course of pulmonary tuberculosis and it is now generally admitted that, provided too much attention is not paid to single examinations and the observer adopts a reasonably critical attitude, it is of considerable value in this condition. Hitherto, this has been almost the only field in which it has been consistently applied, but in our present issue Dr. Payne, working at the Hospital for Sick Children, and Drs. Bach and Gray Hill, working at St. Bartholomew's Hospital and at Queen Mary's Hospital, Carshalton, describe their application of the test to rheumatic infections in childhood. The practitioner dealing with a case of acute rheumatism in a child is faced, once the acute symptoms have subsided, with the dilemma that he may keep the patient invalided too long or may let him up too soon with resulting irremediable damage to the heart. Every practitioner of wide experience can think of children who have been allowed up too soon and in whom cardiac lesions have developed resulting in chronic invalidism and possibly in death; on the other hand, there are no doubt hundreds in bed at the present moment who might be up and about, and going on with their schooling, if only there were some reliable guide to the subsidence or otherwise of the acute inflammatory state. The results obtained independently by Dr. Payne and Drs. Bach and Gray Hill give good grounds for believing that in the sedimentation rate of the red cells we have the necessary criterion. These observers agree that the persistence of a sedimentation rate of less than 10 mm. in the first hour shows subsidence of the infection, while a higher rate is an indication for further rest in bed. Up to the present the sedimentation rate in its application to children has shared with most other "blood" tests the disability attaching to the withdrawal of large amounts of blood; in dealing with children none but the most hardened or those most assured of the benefits likely to accrue from the procedure can face this with equanimity. The technique described by Dr. Payne to some extent does away with this drawback and in the hands of reasonably careful workers should prove accurate enough for clinical purposes.

CARBON DIOXIDE AND SPINAL ANALGESIA.

THE use of carbon dioxide in connexion with anæsthetics, following chiefly from the work of J. S. Haldane and Yandell Henderson, is being repeatedly demonstrated and recommended. The latest contributions to the subject is a paper by C. A. Roeder[1] dealing with the aid which CO_2 can give in those cases, not very uncommon, in which respiration fails after intrathecal injection of an anæsthetic for spinal analgesia. The physiological explanation of both circulatory and respiratory failure in spinal analgesia is still variously given by different authorities. Roeder holds that respiratory failure

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[1] Amer. Jour. Surg, November, 1931, p. 454.

CHRONIC LYMPHANGITIS AS THE CAUSE OF CANCER.

SOME twenty-five years ago Mr. SAMPSON HANDLEY demonstrated the importance of the lymphatic system in the spread of malignant disease, with a wealth of detail which left little room for doubt as to the general accuracy of his views. Since then he has become more and more impressed with the dominant part played by the lymphatic system in physiology and pathology, and his most recent contribution to the subject[1] is an exposition of his theory that chronic lymphangitis with its accompanying lymph-stasis is the actual cause of carcinoma.

Briefly, his theory is as follows. Chronic lymphangitis is the essential change brought about by practically all irritants, microbic, physical, and chemical. This is followed by lymph-stasis which in turn causes overgrowth of tissue and the formation of adenomata and papillomata, the precancerous hyperplasias. The starting-point of the theory is the pathology of lupus and the demonstration of the lymphangitis-papilloma-carcinoma sequence in lupus carcinoma, and it is supported by a mass of observations from other aspects of pathology. It is impossible to consider all the evidence in detail, and the reader must decide for himself how much of it will stand critical examination; but it is clear that it is not all of equal value. About some of Mr. HANDLEY's facts there will be no disagreement, others are disputed; and at times he seems to assign the same value to a supposition as would be given to a self-evident truth. For example, he regards it as proven that gastric ulcer is the precursor of gastric carcinoma; part of his argument rests on the assumption that the pigmented mole is derived from lymphatic endothelium; and he suggests that polypi of the bowel (and vesical papillomata) are most frequently due to a mild non-ulcerative tuberculous infection in childhood, though no proof of this supposition is offered, and the known incidence of tuberculosis and cancer of the intestine is opposed to it. In Mr. HANDLEY's view inflammatory reactions in the subcutaneous tissues seem to be dominated entirely by the lymphatics, and the changes in the tissues as a whole are purely secondary. Few people however will agree with this, nor will Mr. HANDLEY's use of the term granulation tissue be generally approved. And while no one who has seen an acute lymphangitis associated with a septic hand will deny that infection may spread by the lymphatic vessels, is this a justification for describing organisms which give rise to such infections as lymphophilic, and for assuming that the tissue reactions called forth by syphilis and tuberculosis are essentially the same? Without going into the question of the formation of tissue lymph and its circulation—a highly complex business—it may be asked whether stagnant lymph is such a good nutrient medium as Mr. HANDLEY presumes. We know little about it beyond the fact that it must be overcharged with the products of cell metabolism, but it seems unlikely that such a fluid should possess the factors which stimulate the growth of epithelium; and in this connexion it is significant that in one form of Paget's disease of the nipple—that produced by obliteration of the cutaneous lymphatics and lymph-stasis—the secondary epithelial change is atrophic and not hypertrophic.

In his preface the author states that his book is not an armchair speculative essay and asks that the evidence he brings forward should be seriously considered. No one who knows and appreciates Mr. HANDLEY's work—and who does not?—will lightly disregard any observations he makes on the cancer problem. If we are not convinced of the truth of his theory, we are grateful to him for an interesting and stimulating deliverance.

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[1] The Genesis of Cancer. By W. Sampson Handley, M.S. Lond., F.R.C.S., Vice-President of the Royal College of Surgeons. London: Kegan Paul, Trench, Trübner and Co., Ltd. 1931. 21s.

ANNOTATIONS

NEW YEAR HONOURS.

THE list appearing on p. 104 shows that honours have been conferred this New Year on medical men and women who have won distinction in many different occupations. The first name is that of Major Walter Elliot, whose enlightened work in the House of Commons and in office is appropriately rewarded by appointment to the Privy Council. Dr. F. N. Kay Menzies, who has borne and is bearing heavy responsibilities in the organisation of London health services, becomes a Knight of the Order of the British Empire, in company with Dr. A. M. Daniel, whose privilege it is to be director of the National Gallery. First among the new knights in scientific attainment is Dr. H. H. Dale, secretary of the Royal Society and director of the National Institute of Medical Research, but in a different sphere we welcome equally the recognition of Mr. Buckston Browne's perspicacious benevolence towards the social life and future development of medicine. The name of Miss Edith Brown is less familiar in this country but her new rank as D.B.E. is as well deserved as it was little expected when she first went out to India to work in humble circumstances for Indian women. Suitable promotions to knighthood are those of Dr. John Weir, physician in-ordinary to the Prince of Wales, in the Victorian Order, and of Sir James Kingston Fowler, who becomes K.C.M.G. The long and useful life work of Sir Leonard Rogers is fittingly marked by knighthood in the Order of the Star of India. Outside the strict limits of our profession we find with pleasure the names of Miss Harriette Chick, D.Sc., of the Lister Institute, who is appointed C.B.E.; Mr. Henry S. Wellcome, LL.D., a valuable friend of medicine, who is knighted, and Mr. E. W. Morris, of the London Hospital, and Mr. E. D. Simon, M.P., for a brief time parliamentary secretary to the Ministry of Health, who receive the same honour. Other notable names are those of Sir Malcolm Delevingne, who represents Great Britain in conferences on dangerous drugs, and an ingenious way. A tube containing a mercury droplet was introduced into the instrument, and by photographing the movements of the droplet the changes in the blood current could be ascertained. These experiments disclosed a striking difference from the first series of observations; a forward movement of the mercury droplet occurred not only during diastole, but again during the early part of systole. This suggested that an increased coronary flow took place during early systole, as well as in diastole, as Rabatel had claimed. This, however, is an unjustifiable deduction, for the same forward systolic movement of the droplet was found when the coronary capillaries were blocked; it is determined by the elastic expansion of the coronary artery caused by the rise in pressure which accompanies systole, but not by an increased flow through the organ. Thus in a series of beautiful experiments are the inconsistencies between the results of various observers settled, and the belief that the main blood flow through the coronary system occurs during diastole is confirmed.

PLASTIC SURGERY OF THE NOSE.

THE nose is perhaps the most conspicuous feature of the face, and any exaggeration, loss, or deformity thereof becomes an object of undesired attention, and is likely as well to produce disquieting self-consciousness. The extent to which individual noses vary in size and shape without transgressing the limits of the normal is very great, but, to be acceptable, the nose must be in harmony with the features among which it has its setting. The surgeon may be consulted, by reason of appearance or impaired function, concerning the possibility and advisability of changing or restoring a nose which is not satisfactory. The task of giving advice on such a matter is not as simple as it may appear, and we welcome two papers, containing much useful information, which have recently appeared.[1] The first, by G. B. New and F. A. Figi of the Mayo Clinic, deals with the reconstruction of the larger defects by means of pedicled flaps, usually taken from the forehead. The details of the method have been immensely improved since its original introduction as the "Indian" operation very many years ago, in the care and accuracy with which the flaps are fashioned, and more particularly in the adoption of the principle that all flaps covering a cavity must have a lining of skin on both surfaces. New and Figi lay stress on the importance of the mental attitude of the patient in these operations, as in any plastic procedure for improving personal appearance, and state that the operation must be requested by the patient rather than submitted to because advised by the surgeon; for otherwise the patient is not likely to be pleased with even a good result and will chafe at the length of time and the number of operations required. In the second of these papers, by V. P. Blair and J. B. Brown, the correction of smaller cosmetic defects, as well as of the larger deformities, is discussed, and in these the mood of the patient assumes even larger proportions. As they say, it is a general working rule that, the more pronounced the deformity, the more likely is a reasonably good result to be acceptable; but, conversely, it is well to be cautious about embarking upon the correction of slight defects. Adolescents of both sexes, especially those who have no regular employment, are more apt to be over-particular than older people. A patient's inability to state clearly the particular thing that displeases him should excite the surgeon's doubt of his own ability to satisfy; this same uncertainty should also arouse the suspicion that the real fault may not lie in the nose at all, for not seldom a too short or too large chin may be the real but unrecognised offender by disturbing the balance of the features. The all-important details of the numerous plastic procedures are too intricate for brief consideration, and our object here is rather to emphasise the importance of considering the patient's psychological reactions to his, or her, deformity.

AN UNUSUAL TREATMENT FOR PEPTIC ULCER.

EVEN if we believe that the thorough treatment of peptic ulcer by diet and alkalis, on the lines first laid down by Sippy, gives far better results than were achieved before it was introduced, and even if we are unstinted in our admiration of the surgical treatment of chronic peptic ulcer when the operation is performed by a first-class surgeon, we must admit that both methods leave a proportion of inexplicable failures which are a cause of distress to patient and practitioner alike. The ulcer which yields readily to medical treatment is perhaps the ulcer which gives also the most satisfactory results when treated surgically, and, conversely, the very extensive chronic ulcer which does not prove readily removable at operation presents an equally difficult therapeutic problem to the physician. These facts lend additional importance to any novel therapeutic procedure which is backed by authoritative testimony to its frequent or occasional efficacy. On another page of this issue will be found a paper by Prof. Glaessner, of Vienna, who has for some years been using injections of pepsin in the treatment of gastric and duodenal ulcer. He thinks there is evidence of a biological difference between the gastric juice of normal persons and of those suffering from peptic ulcer. On injecting gastric juice from such subjects beneath the skin of a guinea-pig or painting the same substance on the cornea of the animals, he finds that the erosion caused by the juice from an ulcer patient is far more extensive and far slower in healing. Again, he has succeeded in producing artificial ulcers of the skin and mucous membranes of rats, guinea-pigs, and rabbits by the intracutaneous or intramuscular injection of gastric hydrochloric acid, and he has found that the subcutaneous injection of pepsin will notably accelerate healing in such cases. Acting on the results of these (perhaps somewhat scantily controlled) experiments, he has passed on to the treatment of ulcer in human beings by similar injections. The pepsin employed is not sterilised, but is filtered through porcelain under pressure, to rid it of albumin; diluted carbolic acid is added as an antiseptic and a 1 per cent. solution is finally obtained. The injections are said to be harmless and painless. Each patient is given about 30 injections twice yearly, the amount increasing as the series proceeds. Six hundred cases have been treated, and Prof. Glaessner claims that very good results were obtained in fully two-thirds of the 130 which were thoroughly controlled. Objective and subjective cure was brought about in these, although in at least half of them no change was observed in the acid secretion of the stomach before and after treatment. Of all his cases only 6 per cent. required surgical interference.

In assessing the value of these injections it must not be forgotten that certain routine medical treatment was employed simultaneously. Olive oil was given before meals, and an alkaline powder containing bismuth was taken in addition. Preparations of is due either to paralysis of the phrenic and intercostal nerves, or else to ischæmia of the respiratory centre, owing to extreme fall of blood pressure produced by the injection. When the first cause is at work only artificial respiration can effectively remove the disability, but when the second cause is alone active then inhalations of carbon dioxide are of great service. Roeder gives CO_2 during the time of spinal anæsthesia, and, if necessary, two hours afterwards. This he says may carry the patient over an acute emergency, for by making the respiration continue the thorax "acts as a temporary heart providing that the motor nerves of respiration are not blocked." Inhalations of 4 per cent. CO_2 increase the pulse-rate and raise the blood pressure. A percentage of 10 causes headache and mental confusion. With higher percentages the heart-rate drops and the blood pressure, temporarily raised, soon falls with cessation of respiration. Roeder is of opinion that so far from doing away with the necessity for an anæsthetist, spinal anæsthesia demands one of greater training owing to the greater frequency of serious complications. And he should be armed with apparatus for artificial insufflation of the lungs with CO_2 and oxygen. In most operating theatres nowadays cylinders are available containing 5 or 7 per cent. carbon dioxide in oxygen. In private practice, when perhaps this kind of apparatus is not at hand or cannot conveniently be used, the anæsthetist can easily carry his own carbon dioxide by means of an excellent portable apparatus now on the market[2] consisting of small metal cylinders about 7 inches long and less than an inch in diameter, fitted into a neat holder. Delivery of the gas is made very simple; the apparatus is easy to work; it does not take up much room in the doctor's bag; and is not likely to be exhausted by use in one case. The cylinders are, moreover, inexpensive in the first place, and can be refilled at a very small charge.

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[1] Surg., Gyn., and Obst., December, 1931, pp. 780 and 797.

INFECTION AND HEPATIC FUNCTION.

As was emphasised in a recent discussion at the Medical Society of London,[3] the great majority of tests of liver function must, from the clinical point of view, be regarded as valueless. Indeed probably only the van den Bergh and the galactose or lævulose tolerance tests can be said to have any practical application, and that a limited one. The reason for this is partly the complexity and number of functions of the liver, partly the great reserve powers of the organ, and partly, too, the fact that several of the activities previously ascribed exclusively to the liver are also carried out by the extra-hepatic reticulo-endothelial system. Experimental evidence indicates for instance that the excretion of bromsulphthalein (a test of liver function formerly advocated and now largely discarded) is influenced both by blocking the reticulo-endothelial system with Indian ink or by reducing its functional capacity by removal of the spleen (F. Schellong and B. Eisler[4]). An attempt to correlate the results of this test with estimations of serum bilirubin in health and in various infective conditions is included by C. W. Herlitz[5] in his recent investigation carried out on groups of children between the ages of 6 months and 12 years. He found that while the bilirubin values were raised in 65 per cent. of the infections due to streptococci, they were normal in the great majority of respiratory or urinary infections due to other organisms. Bromsulphthalein excretion, however, which was studied in a smaller series of cases, showed impairment in 12 out of 15 infective cases, irrespective of the type of organism responsible. There was thus no parallelism between the results of this test and the bilirubin content of the blood. This was further illustrated by the fact that normal bromsulphthalein excretion occurred in cases of hæmolytic jaundice—a condition in which the functional activity of the reticulo-endothelial system is probably unimpaired. In view of his own findings and of the experimental evidence, Herlitz concludes that the bromsulphthalein test is a test of the function of the reticulo-endothelial system rather than specific for the liver cells. He also thinks that hyperbilirubinæmia, when it appears in infective conditions, may be attributed primarily to increased destruction and formation of bile-pigments in the reticulo-endothelial system, the increase being inadequately compensated for by increased excretion

THE CORONARY BLOOD FLOW.

EXPERIMENTAL work on the blood flow through the coronary artery when it is perfused at a constant pressure has shown that the flow is either stopped or greatly diminished during systole, and that the main flow takes place during diastole. But in the intact animal the coronary system is subjected to perfusion not at a constant pressure, but at one which varies widely during each cardiac cycle according to the changes in the intra-aortic pressure. Observations made 60 years ago by F. Rabatel and recently by M. Hochrein and his co-workers on the circulation through coronaries remaining in connexion with the aorta has given results which are the reverse of those obtained when the artery is perfused at a constant pressure. It was found that besides an increased flow in diastole there was an increased forward movement of blood in the early phase of systole. This was attributed to the increased pressure within the aorta which occurs at this time. These discrepancies are settled by the experiments of G. V. Anrep and his co-workers.[1] They first determined the maximum pressure in the artificially perfused coronary artery at which systole still arrested the flow. This was found to be considerably in excess of the maximum aortic systolic pressure; and in no case, whatever the difference between the aortic systolic pressure and the perfusion pressure, was an increased coronary flow observed to take place during systole. It is obvious from this experiment that the flow must be arrested in systole in an aorta-perfused coronary. This conclusion was confirmed by experiments on the aorta-perfused coronary in which a stromuhr was inserted between the aorta and the coronary cannula. Under these conditions it was found that the coronary pressure is the same in systole as when it is clamped, again indicating that the contraction of the heart stops its arterial circulation. A considerable rise in systolic pressure had very little effect on the flow, but a slight rise in diastolic pressure caused a considerable increase in the flow—for example, a rise of 4 mm. in pressure increased the volume by more than 10 per cent. The inevitable conclusion to be drawn from all these experiments is that the volume of the blood flow through the coronary system is maximal during diastole and minimal during systole. Further analysis of the rapid and detailed changes in the flow was made with the stromuhr modified in

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[2] Obtainable from Sparklets, Ltd., Upper Edmonton, N.18.

[3] See THE LANCET, 1931, ii., 1227, 1228, and 1238.

[4] Zeit. f. d. ges. exp. Med., 1927–28, lviii., 728.

[5] Acta Pæd., 1931, xii., Suppl. V.

[1] Anrep, G. V., Davis, J. C., and Volhard, E.: Jour. Physiol., 1931, lxxiii., 405.

SPECIAL ARTICLES

CATTLE RINGWORM IN MAN.

By George Ashton, M.D., M.R.C.P.

The Ministry of Health recently had occasion to consider the question of the prevalence in this country of cattle ringworm in man. The literature on the subject was consulted, and further information obtained through a special inquiry made by the regional medical staff of the Ministry of Health, who interviewed 384 insurance practitioners in England and Wales whose practices were thought likely to afford opportunities of observing persons affected by the disease. It devolved upon me to collate and summarise the information thus obtained, and it is thought that the following summary may be of interest more especially to medical officers of health and practitioners in agricultural areas.

Historical.—At the end of the eighteenth century there were references to contagious skin affections implicating the body, head, and shoulders of animals, and in 1820, Ernst, a veterinary surgeon in the canton of Zurich, described a case in which a young girl was infected from a cow. Carrère, in 1838, noted that the virus might remain for a long time in stables and advised burning harness and cleaning any other objects, which might have been rubbed by the infected animals. Letenneur pointed out, at about the same time, that cattle ringworm is most common in the spring after the animals have spent a long time in their winter quarters. He advocated quarantine of the infected animals. Malmsten, in 1845, discovered a vegetable parasite, which he then called the "Trichophyton tonsurans" and which belongs *to the hyphomycetes* or moulds. A similar fungus was identified by Gerlach, in 1857, as the cause of ringworm in domestic animals.

The fungi causing diseases of the hair and skin can be divided into two groups, the microsporons and the trichophytons, distinguishable by differences in mycelium and in fructification. The microsporons, which are responsible for the common forms of ringworm of the scalp, are not (with quite unimportant exceptions) concerned in the ringworms of animals which are communicable to man. The trichophytons may be classified as follows :—

(1) *T. endothrix*, affecting the interior of the hair and not primarily the skin, and perhaps exclusively of human origin (large-spored ringworm of the scalp); there are several varieties (? species) including *T. crateriforme* of Bodin (1902), which is possibly the equivalent of Malmsten's "T. tonsurans."

(2) *T. neo-endothrix*, intermediate in mycological character between the human and animal classes and affecting both hair and skin in human beings; one variety has been found in cats; others have not been proved *to occur in animals.*

(3) *T. ectothrix*, the class which chiefly gives rise to disease in animals. These *fungi affect* chiefly the skin and produce in man the typical circinate lesions of cattle ringworm. One group of these *fungi has small spores* resembling those of the microsporons and contains several varieties (? species). This group attacks horses and dogs. The other group has large spores and also contains several varieties among which are some causing *ringworm both* in cattle and horses. Of this group, and particularly common in cattle, are the faviform varieties, *T. album* and *T. discoides*, which produce in culture a mycelium *like that of favus*; but the lesions are characteristically *ringworm* in character and the fructification forms of the fungus of favus are absent.

THE INFECTION IN ANIMALS.

Incidence.—Bovine animals are most readily affected with ringworm, especially young stock animals. Calves are the chief sufferers, and the disease seems to be relatively rare in dairy animals. Dogs and horses are also susceptible. Goats and cats suffer more rarely; pigs and sheep hardly at all. Cattle ringworm is fairly common in this country, but seems *to be limited to certain districts.* It also appears to be more prevalent in England, Holland, France, and Switzerland than in other parts of Europe.

Mode of infection.—The transfer of the fungi of cattle ringworm from the infected cattle to other cattle occurs: (*a*) By direct contact, especially during pasturage. Bulls, in particular, may transmit the infection to a whole herd. (*b*) By indirect contact through the indiscriminate use of infected combs, brushes, clipping-machines &c., or by healthy cattle rubbing against *infected rubbing-posts, stalls, railings,* and gates.

Clinical manifestations.—At the commencement of the disease the characteristic signs are clearly defined circular areas of cutaneous inflammation, either hairless or studded with broken hair; these areas are generally seen on the head and neck and more rarely are scattered over the whole body. Their frequency on the head and neck is largely due to cattle scratching and biting each other on the head and neck, and to the use of infected rubbing-posts. The patches, which are at first the size of a pea, extend at the circumference and may attain the size of a crown-piece or the palm of the hand. They are usually discrete, but may coalesce to form larger areas. Later, vesicles are formed which quickly burst and dry up to form thick crusts and scabs, which may be of a greyish-white or yellowish colour and of a leathery consistence. The presence of these scabs no doubt accounts for the disease being known popularly as "dry scab" and "scab mange." Healing usually proceeds under the scabs, which gradually fall off, leaving slightly scurfy bald patches upon which the hair slowly grows again. On its first appearance, and also during the healing process, the eruption causes itching. The eruption generally lasts from 6 to 12 weeks, but if the normal course is disturbed by rubbing or scratching, fresh outbreaks occur within the healed patches and the ailment may be prolonged for 6 or 12 months or even longer.

THE INFECTION IN MAN.

Incidence.—88 of the 384 practitioners interviewed by the regional medical staff stated that they had not seen any cases of cattle ringworm in man. Of the 296 practitioners who had seen cases, 132 volunteered the statement that the disease rarely came under their observation, the number of cases seen varying from two cases in 25 years to five in one year. Several expressed surprise that, considering the large number of people exposed to infection, the disease did not come more often under their observation. The disease is commonest in persons who work *amongst cattle, such as farm labourers.* Farm workers who handle calves are particularly likely to be infected, the disease being, as already stated, very common in calves, especially during the colder months when they are confined indoors. Ringworm is not so common in milch cows, and for this reason milkmaids and dairymaids are not especially liable to contract the disease. Many cases of ringworm derived from horses and mules were seen in men *attached to mounted units and transport services* during the late war.

Mode of infection.—The disease in man is generally derived directly from infected cattle, but infection sometimes arises indirectly from contact of the hands and wrists with walls, gates, posts, &c., against which infected cattle have rubbed.

Clinical manifestations.—The disease appears to be belladonna and sodium bicarbonate were completely avoided. If there had been no hæmorrhage a mixed diet was utilised at first, but in some severe cases milk and cream was prescribed; and in general the mixed diet described by Prof. Glaessner appears to approximate to that recommended by the majority of physicians in this country. In these circumstances it may well be argued that the pepsin injections played a secondary part in the treatment, but the claims of Prof. Glaessner cannot be overlooked, especially as he has found his method of treatment of use in such resistant conditions as jejunal and œsophageal ulcer, as well as for the simpler lesions in more usual situations. As a practical suggestion the method seems to deserve investigation in this country, while its theoretical aspect is of interest in relation to some of the observations on hydrochloric acid mentioned in our leading article last week.

THE LYMPHOID TISSUE IN THE LUNG.

AN interesting communication on the lymphoid tissue in the lung, by Drs. F. W. Simson and A. Sutherland Strachan, reaches us from the South African Institute for Medical Research.[1] The authors believe that the lymphatic apparatus of the lung is the decisive factor in the localisation of inhaled dust particles, and in the development of pneumokoniosis. According to their observations, dust-laden phagocytes pass from the alveoli of the lung to small intrapulmonary collections of lymphoid tissue, and from these into the lymphatic vessels which drain into the extra-pulmonary lymph nodes. Presumably the escape of phagocytes must be fairly complete, for the tracheo-bronchial lymph nodes may show typical silicotic fibrosis before recognisable changes occur in the lung itself. Nevertheless, a certain amount of dust is retained in the lung, and this progressively increases with the gradual obliteration of the lymph drainage system. The demonstration of the localisation of lymphoid tissue in the lung is by no means easy. It is widely scattered and consists of minute aggregations of lymphoid cells with, possibly, a supporting reticulum, but the nodules are indefinite and difficult to distinguish. They may be more prominent in congestive and inflammatory states of the lung, but in these conditions it is impossible to be certain that recognisable collections of lymphocytes represent a simple exaggeration of the normal distribution; they may well be pathological new formations. In the search for material suitable for their needs, it occurred to the authors that the lungs of children said to have died from "status lymphaticus" might present such a hyperplasia of the normal lymphoid tissue as to make its distribution clear. Whether or not the diagnosis of the cause of death in these cases could be substantiated is immaterial; it is sufficient that the authors obtained lungs which, while apparently free from changes due to previous disease, presented a very definite increase of lymphoid tissue. And after careful comparison with many other lungs it seemed certain that these hyperplastic areas were normal in their distribution. Their preparations, some of which are admirably illustrated in the paper, have convinced Dr. Simson and Dr. Strachan that previous descriptions of the distribution of lymphoid tissue in the lung are in need of modification. It has been described, for example, as occurring along the course of the pulmonary artery and at the junction of the smaller tributaries with the larger branches of the pulmonary veins. But in this series of cases, the distribution of lymphoid tissue is in strict relation with the respiratory tract, and is in no way related to the vascular system except in situations where air passages and blood-vessels come into juxtaposition; and even here it seems clear that the association is in no sense physiological but purely anatomical. Lymph channels traverse the lung, of course, in close relation with blood-vessels, but in no part of their course do they appear to be interrupted by lymph nodes; these appear to be functionally related to the air tubes, and the air tubes alone. The authors discuss the application of their observations to the localisation of infections as well as dust, and suggest that chronic tuberculosis of the lung affects first the lymphoid tissue when the infecting dose is minimal. Further work on these lines is in progress, and the subject appears to be one well worth pursuing.

A GREAT JOURNALIST.

THE bond between editors, whether of technical journals or of daily newspapers, is, or should be, a common ideal. Whether the screen on which they display the moving picture of their times is large or small, neither editors nor the journals they conduct will gain recognition or esteem unless they see to it that the light which illuminates the picture throws a steady beam of truth. The public from whom they seek support may be drawn from all classes and schools of thought, or may follow a special discipline, but it is quick, and growing rapidly quicker, to detect distortions, omissions, or artificial devices in the presentation of facts. These reflections arise from the news of the death of a great journalist, C. P. Scott. Every journalist has been assailed by the temptation to adjust facts to support a theory or to fit a policy, and learns early to regard integrity in this respect as a major virtue in his colleagues. This virtue, with many others, was in Scott, and his good repute will long be a public memory.

Mr. Wilfred Trotter, F.R.S., has succeeded Sir Hugh Rigby as sergeant-surgeon to the King, and Sir Hugh becomes an honorary surgeon to His Majesty.

Dr. George Proctor Middleton has been appointed surgeon apothecary to H.M. Household at Balmoral, in place of Sir Alexander Hendry, who has resigned.

The King has nominated Mr. Douglas Hacking, M.P., to be for five years a member of the General Medical Council, in succession to Sir Edward Hilton Young, now Minister of Health.

THE Hunterian Oration of the Royal College of Surgeons of England will be delivered on Monday, Feb. 15th, at 4 P.M., at the College by Mr. Wilfred Trotter. In the evening a dinner will be given by the President and Council of the College.

HOSPITAL GROUNDS AS BIRD SANCTUARY.—The South Staffordshire joint small-pox hospital board has refused to entertain an application for the letting of shooting rights in the grounds of the hospital. The reason given is that, as the result of the scheme of afforestation some years ago, the waste land on which the hospital was originally placed has become a bird sanctuary.

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[1] Lymphoid Tissue in the Lung. Its Distribution as Illustrated by a case of "Status Lymphaticus" and its Importance in the Localisation of Inhaled Particulate Matter. By F. W. Simson, M.B., Ch.B. Edin., and A. Sutherland Strachan, M.A., B.Sc., M.D. Glasg. Publications of the South African Institute for Medical Research. 1931.

th large practices in agricultural districts speak of e extreme rareness with which they see cases of ttle ringworm.

Prevention can be largely secured: (1) by issuing structions to farm labourers, &c., as to the infectious ture of the disease; (2) by the provision on the farm suitable places for washing and disinfecting the nds of those who have been in contact with infected ttle; (3) by wearing a washable overall whilst ndling infected cattle and by wearing a washable p whilst milking; (4) by calling attention to the nger of dressing sores, &c., on infected cattle with e naked hands instead of wearing india-rubber oves—which should always be provided and worn r this purpose; (5) by cleansing and lime washing l rubbing-posts, stalls, railings, gate posts, &c., th which it is known that infected cattle have been contact; (6) by preventing children kissing and calves; (7) by ensuring the observance 13, of the Public Health (Meat) Regulations, 24, which prohibits the "blowing" or inflation with e human breath of carcasses of calves slaughtered r human consumption.

The more serious forms of the disease can be revented by advising farm labourers and others apply for medical treatment immediately on the rst evidence of the disease.

My thanks are due to Dr. F. Griffith and Dr. W. M. cott, of the pathological laboratory of the Ministry f Health, for their assistance in preparing the paraaphs dealing with the pathology of the disease.

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NORTHAMPTONSHIRE CONVALESCENT HOME.—Mrs. J. G. Shipman has given her late residence, Templemore, Dallington, as a convalescent home for the Manfield Orthopædic Hospital, Northampton, and it has just been handed over. It will be known as the John Greenwood Shipman Home, in memory of the late Dr. Shipman.

UNITED STATES OF AMERICA.

(FROM OUR OWN CORRESPONDENT.)

MILK CONTROL.

DURING the last eight years persistent efforts have been made by the public health service to unify methods and to raise the standards of milk production in the United States. These efforts have both a hygienic and an economic purpose. It has been found that frequent changes in municipal ordinances governing milk-supplies are very expensive to the dairymen, and keep up the price of milk to the consumer. The lack of uniformity in dairy equipment has also increased the price of such equipment to an uneconomic level. A uniform standard approved by high authority is also a great aid to local health officers, many of whom have more training in pharmacology than in the technical aspects of milk *production*.

Within eight years 444 municipalities, embracing a population of some 7½ million people in 25 States have adopted the standard milk ordinance, and are now working under the same system of dairy regulation. In the December number of *Western Hospital Review* Mr. Leslie C. Frank, the sanitary engineer in charge of the Office of Milk Investigation of the Public Health Service, reviews the achievements of this period. He points out that in the seven years 1924–1930 no less than 327 milk-borne outbreaks of communicable disease, 217 of these being outbreaks of typhoid fever, have been reported by State and city health officers. These represent only the outbreaks which have been traced to milk. The fact that the number of such outbreaks does not appear to be diminishing (there were 44 reported in 1930) may perhaps be due to increasing epidemiological skill which is offsetting improved regulation. At any rate the danger of insanitary milk is clearly demonstrated, and Mr. Frank argues that it is best met by the standard milk ordinance on the following grounds:—

The ordinance sets up requirements that guarantee a pure milk-supply. These deal with conditions on the farm as well as with conditions in the pasteurising and distributing plants. It also supplies the health officer with the most powerful available devices for enforcement of the regulations. The grading of milk is regarded as an enforcement device, for it is difficult to sell any milk that is not Grade A in this country. If withdrawal of the Grade A label does not enforce compliance the supply may be barred from the market by revocation of the producer's permit. Penalties are also provided.

What is known as the Public Health Service Milk Code takes up separately each item of the ordinance, explains the reason for it, and describes what may be regarded as the satisfactory limits of compliance. The dairy industry should be given a specified time in which to adjust itself to the new requirements, it being understood that at the end of that time the first announcements of grades will be made. Six months is generally considered to be an ample allowance for this purpose.

"There can no longer be any question," writes Mr. Frank, "but that authoritative and expert opinion is almost unanimously to the effect that all milk should be pasteurised." Tuberculin testing gives almost complete protection against tuberculosis. Stool and urine examinations and Widal tests may eliminate most typhoid carriers from among employees, but no one believes that such tests exclude all carriers.

limited to exposed parts; the hands, wrists, forearms, and upper arms are the parts most commonly affected, since they are those most liable to come into contact with the infected cattle in handling them. The custom amongst farm workers of working during the warm periods of the year with their coats off, and their shirt sleeves rolled up, may also increase the risk of infection. The disease occasionally spreads to parts which are liable to be scratched by the affected hands, such as the head and neck. Occasionally the cheek and forehead are affected through a milk-maid resting her face on the flank of the infected cow whilst milking. The disease may occur around the mouth in children, through kissing and fondling young calves.

The disease may appear as: (1) Rings of inflammation, which may be scaly, vesicular, or pustular. The degree of inflammation varies, but as a rule it is more intense than in lesions due to purely human parasites. (2) Patches or plaques of inflammation which have a rounded or festooned outline. These plaques may be scaly or show vesicles and pustulation.

Persons who have contracted ringworm from cattle are sometimes seriously affected, owing to:—

(*a*) The wide extent of the original infection.

(*b*) A secondary infection of the ringworm patches by septic organisms. This may be facilitated by treatment with drastic local remedies, such as strong cresol preparations, which have been supplied by the neighbouring chemist or veterinary surgeon for use on cattle. The indiscriminate application of these remedies damages the skin, and so provides a suitable habitat for septic organisms.

(*c*) Involvement of the beard region, which may result in inflammation and suppuration of the hair follicles with surrounding infiltration of the skin.

(*d*) Involvement of the scalp, which may result in raised, boggy, phlegmonous swellings with numerous small abscesses, and may lead to inflammation of the glands of the neck.

(*e*) Involvement of the nails, with suppuration; this condition, however, is very rare.

Constitutional disturbance is rare except in cases in which there has been secondary infection by septic organisms; symptoms of septic absorption of varying severity may then occur.

Occasionally the infection in man may assume epidemic proportions. Thus in 1840 most of the inhabitants of the Swiss village, Andelfingen, were reported to be infected with ringworm by sick cattle. During the late war several extensive outbreaks occurred behind the French lines at Verdun, among men tending the large herds of cattle that had been assembled there for feeding the armies.

I am indebted to Captain W. Watt, M.R.C.V.S., of the Ministry of Agriculture and Fisheries, for the following notes on an outbreak of cattle ringworm which occurred at the Cattle-Testing Station at Pirbright in 1925.

The officers and attendants in attendance on the infected cattle were dressed in rubber overalls and sou-wester hats which were sprayed with 1½ per cent. solution of lysol and their hands were washed in this solution on leaving each box. Their hands and faces were washed with carbolic soap before leaving the compound. In spite of these precautions, the following members of the staff became infected.

A veterinary officer cut the point of his chin whilst shaving, and although tinct. iodi fort. was applied the wound began to pour out serum and the tissues began to swell. A second area developed on his chin and was quickly followed by more infected areas. One of the larger areas developed a ring-like appearance and the skin tissues were much thickened. Microscopical examination showed the infecting organism to be a species of *T. ectothrix* and the clinical features of the eruption were such as to make reasonably sure that the infection was with a fungus of animal origin, and not with one of the human varieties, which are in general rather less virulent. Under a simple starch poultice treatment the inflamed tissues gradually became normal but the officer was left with 13 small areas on his face, which are devoid of hair. The duration of the infection was two months.

Four of the attendants were affected. No. 1 was infected on the upper lip, which became more than twice the normal thickness for a time. No. 2 had an infection on the forearm and on the chin. The tissues in both areas were raised up, and had the appearance and colour of an over-ripe strawberry. No. 3 had an area on the back of his hand which poured out serum and developed a crater-like centre. No. 4 had a slight infection of the forearm, which yielded rapidly to treatment.

DIAGNOSIS.

A certain diagnosis of the disease cannot be made without a microscopical examination to demonstrate the presence of the causative fungus, but the large majority of those practitioners interviewed who had seen cases were satisfied that a sufficiently reliable diagnosis could be made from the history and the naked-eye appearances on the following grounds: (*a*) history of prevalence of the disease amongst cattle, or of the coexistence of cases of the disease amongst fellow workers; (*b*) occupation of the patient; (*c*) position of the patches of disease, generally on the hands or arms, a site which is uncommon in other forms of ringworm; (*d*) character of the lesions.

As a matter of fact, the patients usually diagnose the condition for themselves, through their knowledge that cattle affected with the disease are under their care, and that the affected parts are the hands and arms.

Differential diagnosis.—As contrasted with the commoner forms of human ringworm, the lesions of the animal variety affect more particularly the skin, and are peculiarly inflammatory in character; while the fact of contact with cattle obviously affected with ringworm is usually sufficient to settle the animal origin of the lesions. But, if scientific proof were required a complete research would be necessary in each case, establishing on mycological grounds the identity of the fungi cultivated from the human patient with the fungi cultivated from the suspected cattle.

Margarot and Deveze have drawn attention to the fluorescence of hairs infected by ringworm in light filtered through glass containing nickel oxide, known as Wood's glass. They have differentiated between the fluorescence of microsporon and tricophyton infections and state that hairs infected by tricophyton exhibit less fluorescence than those infected by microsporon, but still show a characteristic reaction. More recently Kinnear has reported that only microsporon infections give fluorescence which is entirely absent in tricophyton infections. The great value of these observations in human ringworm of the scalp is in ascertaining the completeness or otherwise of the cure. As neither the diagnosis nor the treatment of cattle ringworm in the human subject presents much difficulty, the method is not likely to be of much practical application in this condition.

PROGNOSIS, TREATMENT, AND PREVENTION.

Prognosis.—Most cases clear up in a few days, often without treatment. Cases, however, occur in which the disease spreads widely and may for weeks prove very resistant to treatment. Suppuration in the scalp or beard may be the cause of inconvenience and suffering for some months.

Treatment.—Most cases are so slight that they are readily cured by home remedies. Treatment by the local application of tincture of iodine or a cresol disinfectant, by the patient himself or by his employer, seems to be so well known and so effective that the large majority of patients do not seek medical advice. This may account for the fact that many doctors

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A committee of medical men which has been asked to report has made several important suggestions, and proposes, inter alia, that the treatment of shock be completely revised. It is recognised that resuscitation must take place at the water's edge, and that the patient must not be moved until it is complete. The present teaching is that while resuscitation is proceeding the patient lies on the cold sand in a wet bathing costume until it is finished, when "restoration of the circulation" is carried out by means of vigorous rubbing towards the heart, accompanied by firm slapping of the palms of the hands and the soles of the feet. It is recommended that this rubbing and slapping be entirely discontinued, and that, where assistance is available, the treatment of shock should be begun immediately the patient is brought ashore and whilst resuscitation is proceeding. The measures recommended include drying the patient, laying him on and covering him with a blanket, and the application of warmth.

The method of resuscitation advocated is the Schäfer method with a slight modification. Experimental investigation of pulmonary ventilation during artificial respiration was carried out by Prof. Whitridge Davies at Sydney University to decide a number of doubtful points, and it was found that an excess of ventilation was produced, and that any attempts to produce more ventilation by particular sites for application of the operator's hands or by placing the patient's arms fully extended above his head were unnecessary. The rate recommended was 12 per minute—i.e., five seconds for each complete swing; three forward (expiration) and two back (inspiration). This ratio, which is contrary to normal breathing, was recommended because in artificial respiration expiration is the active movement. Further, investigation of the blood of animals drowned in sea water showed a marked increase in the salinity of the blood of the left ventricle, and a dehydration of the blood.

The modification of the Schäfer method mentioned above refers to the position of the operator in regard to the patient. At present he works from the left side of the patient or astride his body; it is now proposed that he should straddle the patient's left knee between his knees. This gives the greatest ease to the operator, especially to his wrists, which are likely to become very tired.

Consideration is also being given to aspects which particularly affect medical men—e.g., the use of Hewitt's airway and inhalations of oxygen and carbon dioxide during resuscitation, intracardiac injections of adrenalin, and particularly the length of time for which resuscitation should be continued. In regard to this, it is recommended that it should be continued until recovery, or for at least two hours, and only discontinued on the advice of a medical man. Further, all who have been resuscitated must be admitted to hospital, and someone trained in the methods of resuscitation must be present with the patient until such admission takes place.

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Roughly 300 cases of typhus are known to have occurred in Australia, distributed as follows: Victoria, 1; Queensland, 55; South Australia, 143; Western Australia, 93; Tasmania, nil; New South Wales, 7. Probably many cases have been overlooked, and until the medical profession in Australia consider the possibility of

Expert opinion, however, is divided on the best method of securing pasteurisation. Compulsion, especially in small communities, is often unjust to firms that are too small economically to install the necessary machinery and results in a monopoly of the milk industry by one firm. The health education of the people as well as the local conditions of the industry must determine whether and when pasteurisation shall be made compulsory.

CASUALTIES AT FOOTBALL.

Much discussion has taken place in the press of late regarding the hazards of American football. Deaths from football are not officially notifiable but 40 are known to have occurred during the autumn and winter of 1931. A few of these are attributable only indirectly to the game as that of a boy, aged 16, who was scratched at football and died of septicæmia two weeks later, or another who died about the same time having ruptured his appendix during a game of football and having concealed his injury until the end of the match. Such deaths could result from any form of sport, but the great majority of football deaths are due directly to violence and it is significant that of these 40 deaths only eight were college men, for in college football the greater strength of the combatants is made less dangerous by the greater skill of these highly trained players. It has been said that 40 deaths is not a large number compared with the number of automobile fatalities and this is true. On the other hand insurance companies do not penalise their clients for riding in automobiles, whereas they have of late refused to issue policies against accidental death and injury to football players except at unusually high premiums. Personal experience during four years as a college physician leads me to suspect that the disabling accidents of football are more important than the deaths, but I know of no published figures on this subject.

American football demands from its votaries so many hours of attentive study with a professor of football tactics (called a coach) and such exercise of memory that one marvels that it should be classed as a recreation. Perhaps the coeducational system is a factor in its popularity. For there is no doubt that a good football player exhibits qualities both of strength and of skill that endear him to the other sex. Perhaps, too, these very qualities rank higher in the scale of virtues adopted by a young nation than they do among the more sophisticated nations of Europe.

MEDICAL PRACTICE IN CALIFORNIA.

The latest study published by the Committee on the Costs of Medical Care concerns the medical facilities of San Joaquin County, California. The 100,000 people living in this county spent $3,609,063 on medical care in the year 1929 for the prevention and cure of illness. Physicians received 24 per cent. of this sum, hospitals the same proportion, drug stores (chemist's shops) 19 per cent., and dentists 16 per cent. About 3 per cent. of the total was devoted to public health activities. Of the 79 practising physicians, 14 are specialists, 18 are "partial specialists," and 47 are general practitioners. The specialists work 40 hours per week, the partial specialists 48 hours, and the general practitioners 57 hours. The median numbers of patients treated are respectively 900 for the specialist, 1475 for the partial specialist, and 800 for the general practitioner. The median net income for all physicians is $5455. The net incomes vary from a loss of $256 to an income of over $30,000. Seven osteopaths made an average net income of $5121, 14 chiropractors an average of $2781, 17 Christian Science practitioners an average of $1882.

AUSTRALASIA.

(FROM OUR OWN CORRESPONDENT.)

CONTRIBUTORY SCHEMES AND THE MEDICAL PROFESSION.

I HAVE previously referred to the crisis in the finances of the hospitals in Australia and some of the means adopted to relieve it. Most of the hospitals are largely dependent on government aid for their upkeep, and each State has taken different steps to meet the position. Thus in Western Australia a special hospital tax has been imposed, while New South Wales and Queensland have instituted Government lotteries.

New South Wales has now started a scheme of voluntary contributions which has given much concern to all medical practitioners of the State. It is not industrial, but is intended for the whole community, and people of every financial status are invited to participate. It is expected ultimately to absorb all existing schemes, but is otherwise not intended to interfere with the ordinary sources of revenue of the participating hospitals.

By a system of regular contributions of 6*d*. per week from every person willing to join, it is hoped to provide a regular volume of income. The main benefits are as follows:—

1. Contributors, who by reason of their financial circumstances are eligible for admission to a public hospital and are medically certified as requiring indoor accommodation in an acute hospital, shall not be required to make any payments to the hospital towards the cost of hospitalisation of themselves or their dependents, and shall not be required to pay any medical fees.

2. Other contributors will be given credit of 7*s*. per diem off the cost of accommodation for private or intermediate patients as the case may be, and shall only be required to pay the hospital the difference between 7*s*. per diem and the charges fixed for private or intermediate accommodation and medical fees as laid down.

Contributors and their dependents will be entitled to the benefits for a period of 12 weeks in any 12 months. X ray and other scientific services will be available free of charge to persons eligible for public ward accommodation, and for others at certain charges to the hospital, to be determined, together with the fees of the radiologist, pathologist, and so on. It is also proposed to establish a special fund for the purpose of supplying destitute persons, whether members of the fund or not, with artificial limbs, spectacles, and special appliances for the sole use of the patient.

The opinion of the profession in Sydney on this scheme is probably best expressed in resolutions which were passed at a meeting of the British Medical Association on Oct. 30th, in which it was agreed that any contributory scheme, industrial or otherwise, providing for out-patient services to the contributor is not acceptable. Further, the medical profession, whilst affirming its traditional principle of free treatment for the indigent sick, insists that its interests be conserved in regard to the other classes of the community by payment for services rendered. The profession is prepared to support the scheme, provided proper arrangements are made to safeguard the interests of medical practitioners in regard to intermediate and private patients.

The B.M.A. in Victoria has also had a scheme under consideration. It is a proposal for voluntary surance providing for domiciliary, investigational, and pharmaceutical services on the one part, and consulting and specialist, nursing, and hospital services on the other. Besides any capitation fee paid to doctors for any of the above services, the patient will be required to pay a visitation or service fee for each service rendered. It is further proposed to establish funds to provide cash benefits to assist in the payment of consultant and specialist services, and to assist in the payment of medical and surgical nursing. Where contributory schemes are initiated or under the control of lay bodies, it is resolved by the Victorian branch that the medical profession shall have adequate representation on the executive, that a proportion of the contributions shall be used solely for medical benefit, that all benefits shall be in the form of cash benefits to subscribers, and that contributors as such shall not be given any direct representation upon the executive.

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lous cases, diagnosed as measles, typhoid fever, &c., it will not be possible to form any accurate idea of the incidence. It has only been known in New South Wales since 1927. The disease appears to be more common in males than females, particularly between the ages of 31 and 40 years, and during the winter months. The association of the prevalence of rats and mice has been particularly investigated, and, in South Australia, it has been thought that its incidence coincided to some extent with the demolition of buildings and consequent spread of rats. The tropical rate mite (*Liponyssus bacoti*), whose bite, it has been suggested, spreads the disease from infected mice, is known to occur in Australia, and, in fact, was first reported as a blood-sucker of man at Sydney by Hirst.[1]

THE LÜBECK TRIAL.

(FROM OUR BERLIN CORRESPONDENT.)

(*Continued from 1931, ii., 1429.*)

THE question whether B C G may in certain circumstances become virulent, which is of great importance to the accused, has been fully debated by numerous medical experts. The court thus has more and more become a medical forum, the presiding judge seldom interfering with the discussions of the experts, because he is anxious to avoid a possible quashing of the verdict by the High Court of Leipzig, which would mean a repetition of the whole trial.

Prof. Hans Much, of Hamburg, said that there are stocks of B C G which are innocuous, and others which may become virulent. He mentioned a report received by him from Bulgaria where there had been an accident similar to the one in Lubeck. Asked by the public prosecutor whether the B C G might have become virulent by cultivation on an albuminous medium with hæmatin, he answered that according to Petroff's view this might happen. Prof. Martin Hahn, director of the Hygienic Institute of Berlin University, said that Prof. Deycke had taken a great risk by producing B C G on an albuminous medium. It was unnecessary to have produced the vaccine in Lübeck at all, when it could have been purchased from the Robert Koch Institute in Berlin, or from the Pasteur Institute, which is prepared to send cultures and even emulsions abroad to places further away than Lubeck. Prof. Uhlenhut, of Freiburg, said that the efficacy of the Calmette method has not yet been proved. With Prof. Sesiffert he had in a single instance found, like Petroff, dissociation of the B C G into three different species. One of these was very virulent, and guinea-pigs vaccinated with it developed tuberculosis. If B C G may under certain conditions cause tuberculosis in guinea-pigs it is wrong, he said, to give it to patients without a previous test on animals. In Lubeck, however, something particular must have happened to cause so high a mortality: either the primary culture was virulent, or it was contaminated or exchanged. He was of opinion that there should have been a special laboratory for the production of the vaccine. The work done in Lübeck was done without enough care and without the sense of responsibility required when producing a vaccine for human beings.

Prof. Wilhelm Kolle, of Frankfurt, did not agree with Prof. Uhlenhut about Petroff's experiments. They had, he said, been repeated at the Robert Koch Institute, at the German Health Office, at the Pasteur Institute, and at his own institute for experimental therapy, and the results were always negative. He believed the disaster was due to mixing of the B C G cultures with the stock of bacilli from the Kiel laboratory. Sister cultures of the original B C G sent to Lubeck had been sent to Riga and to some places in France without doing any damage to the thousands of children vaccinated with them. Prof Deycke then reported that he had made experiments on himself to ascertain whether the Kiel culture and the cultures obtained from organs of dead Lübeck infants were the same or different. He found that the cutaneous reaction produced by the Kiel culture was much stronger than that produced by the Lübeck culture. He showed photographs in which the different degree of reaction could be seen. Prof. Ludwig Lange, of Berlin, said that a cutaneous reaction was inadequate evidence. The original Kiel culture had certainly been altered by passage through the bodies of the infants.

IRELAND.

(FROM OUR OWN CORRESPONDENT.)

HONORARY FELLOWSHIPS.

AT their meeting on Jan. 1st, 1932, the President and Fellows of the Royal College of Physicians of Ireland elected two honorary Fellows, Sir Almroth Wright, F.R.S., and Mr. Edward Francis Stephenson. Sir Almroth Wright is, of course, an Irishman, and received his medical education at Trinity College, Dublin, whence he graduated M.B. in 1883. Among the honorary degrees and diplomas that he already possesses are the D.Sc. of Dublin University, and honorary Fellowship of both Trinity College and the Royal College of Surgeons in Ireland. Dr. Stephenson is himself a licentiate of the College which now grants him an honorary Fellowship, and is a Fellow of the Royal College of Surgeons in Ireland. His early professional work was as dispensary doctor in Dunmore, County Waterford, until some 20 years ago he was appointed a medical inspector of the Local Government Board of Ireland. In 1919 he became an acting commissioner and member of the Board, and after the change of government he was chief medical adviser of the Department of Local Government and Public Health. In that capacity he has had a great responsibility in the reorganisation of the medical services of the country, and in the development of public health work which has taken place in the last few years. The compliment paid him by the Royal College of Physicians may be regarded as a recognition both of the value of his public constructive work and of the esteem in which he is held as a just and capable administrator.

COVENTRY AND WARWICKSHIRE HOSPITAL.—Owing to financial pressure it has been decided by the board of management of this hospital that, as a temporary expedient, a registration fee of 6*d.* be charged to all new out-patients and 1*s.* to all new cases referred to the massage and electrical departments and to the X *ray department*; that medicine be supplied at the rate of 3*d.* for one week's prescription and 6*d.* for two or more weeks; that the maintenance charge for paying patients admitted on the lower scale be raised from 1½ to 2 guineas a week, and that all patients, except such as were admitted under contract, be asked to make a voluntary contribution towards their maintenance of not less than 2*s.* a day. Necessitous cases will always be treated free. It was roughly estimated that there would be a deficit on the year's working of nearly £8000. and an accumulated deficit on the general fund of £17,500.

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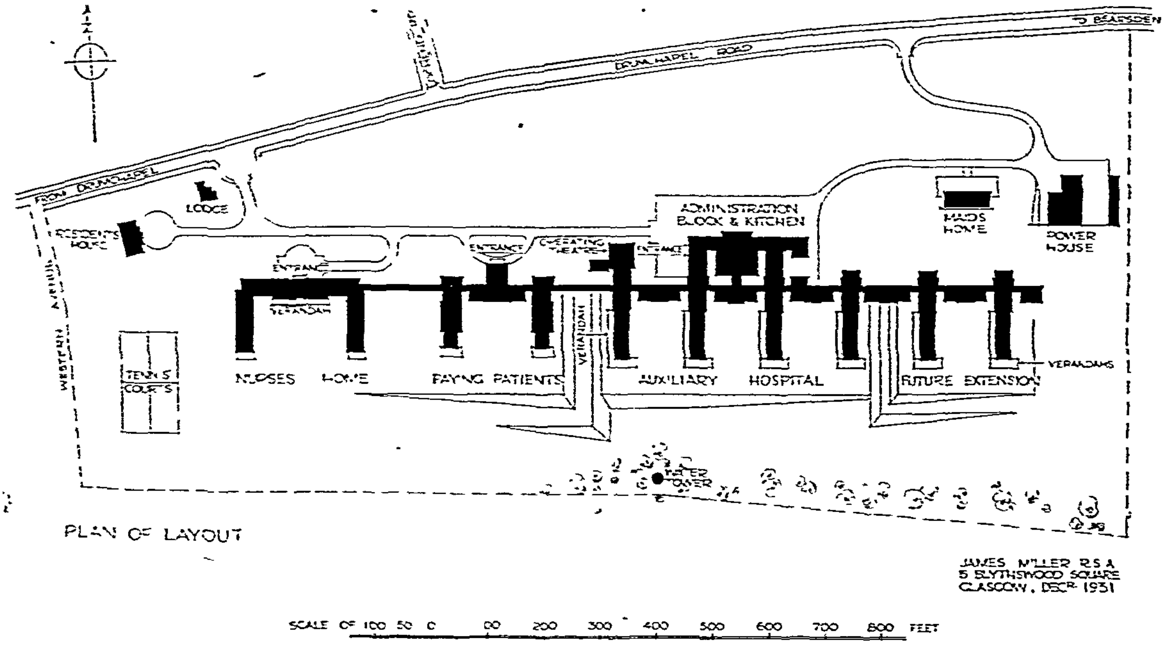
[1] Bull. Entom. Res., 1914, v., 225.

GLASGOW'S NEW HOSPITAL.

(FROM OUR CORRESPONDENT IN SCOTLAND.)

At a time when many people shake their heads bout the future of the voluntary hospital movement, is gratifying to find that the managers of the lasgow Royal Infirmary have taken a great new ep. They have decided to provide a "pay" ospital for patients of moderate means, and a ursing home on the same site. Ultimately, these ew institutions will accommodate 368 patients in the uxiliary hospital and 120 in the nursing home, a tal of 488. This step forward has been made ossible by two things: first, the enterprise of r. James Macfarlane, LL.D., chairman of the Royal nfirmary, who several years ago saw the need for this evelopment and received contributions from many terested people towards it; second, a gift from Dr. Macfarlane and his brother of the additional site of 16 acres, making 32 acres in all, free of all burdens.



Royal Infirmary Auxiliary Hospital and Nursing Home, Canniesburn.

The architect, Mr. James Miller, F.R.I.B.A., of Glasgow, has provided the accompanying plan, which shows that the auxiliary hospital consists of six ward blocks, all placed on the south side of the main corridor. In addition to the large wards, which have 120 beds each, two small wards of four beds each are attached to each ward unit.

These smaller wards are placed on the south side of the main connecting corridor, with a large day-room for patients placed between. This arrangement allows these wards and day-room to have a southern aspect with an uninterrupted view of the grounds. Their windows, which will be of the sliding type, occupy the entire length of the room, and can be thrown completely open, transforming these apartments into large open balconies, so to speak, in fine weather. The above arrangement has the further advantage of reducing the length of the projecting main ward blocks, and, as the latter are spaced with ample space between, the depressing effect of the narrow and deep blind alleyways formed by the ward blocks, as found in many hospitals, is avoided. A new feature of the large wards is that the sanitary block is placed at the entrance end of the wards instead of at the extreme end, an open verandah taking the place of the sanitary block at the south end of each ward.

On the west side of all the main wards continuous verandahs are arranged with every alternate window in the ward formed as a French casement, so that beds can be wheeled on to the verandah. The side verandahs combined with the verandahs at the ends of the wards will be capable of accommodating the whole of the 20 beds in each ward. Instead of being placed at right angles to the walls the beds are placed parallel to the side walls, and each group of four beds is separated from the remainder by means of glazed screens of enamelled steel 7 ft. high. Every ward in the hospital and nursing home is planned with its main axis running north and south, thereby ensuring the maximum of sunlight.

The administration block is placed to the north side of, and central to, the ward section of the hospital. Advantage has been taken of the levels of the ground to place this block one storey below the ground floor of the main ward blocks, while a main service corridor on the same level as the administration block and connecting with it, links up all the ward units in the auxiliary hospital as well as the nursing home and the nurses' home, an arrangement which has the advantage of preventing general traffic passing through or near the ward units.

The nursing home is placed to the west of the auxiliary hospital, and provides for 120 patients. The majority of the beds in this block are in single wards, while there are four wards containing four beds each.

The nurses' home is to the west of the nursing home and accommodates 128 nurses. A connecting corridor links up the home with all sections of the scheme.

The plan represents the complete scheme, and at present it is proposed to proceed only with the first section. No public appeal for funds has been made, and the sum available is only £75,000. But as the site is free, the managers propose to make a start by applying these funds for the purposes for which they were intended.

MEDICINE AND THE LAW.

"B.P." as a Description of Drugs.

It is reasonable to say that to doctors and chemists the letters "B.P." indicate the British Pharmacopœia; when applied to medicinal preparations, they probably convey the same significance to members of the public. If private firms seek to market such preparations bearing the letters "B.P." as a trade description, there is obviously a risk of confusion and misunderstanding. The General Medical Council, which has statutory responsibilities of a national kind with respect to the British Pharmacopœia, has felt obliged to bring an action (reported in the *Pharmaceutical Journal* for Dec. 26th) against Barrett Proprietaries Ltd., manufacturing chemists of Blackburn, who have been using the letters "B.P." in marketing their goods. It is true that the Council is not a commercial undertaking financially affected by the sales of competing commercial undertakings; its functions are limited to publishing the list of standard drugs. Nevertheless, when it applied to Mr. Justice Clauson just before Christmas for an injunction against Barrett Proprietaries, it could reasonably protest that this marking of the defendant's goods was calculated to lead purchasers to suppose that the goods were of British Pharmacopœia standard. If the public were thus deceived, the reputation of the Council might suffer. Some of the Barrett preparations (for instance, stomach and indigestion mixture) were articles which would never be included in the British Pharmacopœia; the public must not be allowed to suppose that the Council was exceeding its proper functions and launching forth into the prescription or recommendation of stomach and indigestion mixtures. Attention was drawn to the fact that Mr. Barrett, the head of the defendant firm, had chosen the suffix "Proprietaries" though no proprietary rights were claimed for his preparations; had he done this in order to give some colour of right to the use of the letters "B.P."? On the other hand the defendants offered evidence that Mr. Barrett had been in the drug trade all his life, that he adopted the word "Proprietaries" because the company intended some day to sell proprietary preparations, that the company's goods thus marked had been on sale for some months, that the marking could not be changed without great expense, and that neither chemists nor anybody else would connect the Barrett "B.P." with the British Pharmacopœia.

At this stage the proceedings were in the form of an *ex parte* motion for an injunction. An injunction cannot be granted unless the party claiming it has sufficient interest in the relief claimed. The learned judge found himself unable to grant the injunction, apparently through doubt whether the Council could show pecuniary damage. The case will now proceed so that evidence may be heard on both sides. The judge's comments seem to show that the action initiated by the Council was not unjustified. Without anticipating the ultimate decision, he did not disguise his first impressions. He expressed surprise that honest traders, intending honestly to carry on business as sellers of drugs, should ask him to believe that they did not realise that this prominent use of the letters "B.P." would imply connexion with the British Pharmacopœia. Though the defendant company said it had incurred great expense in marketing its goods in this way, he would have been glad if they had asked for an opportunity of revising a method of trade which would hardly commend itself to high-minded traders.

NEW YEAR HONOURS.

The list of honours issued on Jan. 1st contains the names of the following members of the medical and dental profession:—

Privy Councillor.

Major Walter Elliot Elliot, *M.C.*, M.B., M.P.
Financial Secretary to the Treasury.

K.C.S.I.

Major-General Sir Leonard Rogers, C.I.E., F.R.S., I.M.S., retd.
President of the India Office Medical Board.

K.C.M.G.

Sir James Kingston Fowler, K.C.V.O., C.M.G.
Member of the Colonial Advisory Medical Board.

K.C.V.O.

John Weir, C.V.O., M.B.
Physician-in-ordinary to the Prince of Wales.

K.B.E.

Frederick Norton Kay Menzies, M.D.
Medical officer of health and school medical officer, London County Council.

Augustus Moore Daniel, M.B.
Director of the National Gallery.

D.B.E.

Miss Edith Mary Brown, L.R.C.P.
Principal of the Women's Hospital and Christian Medical College, Ludhiana, Punjab.

Knights Bachelor.

George Buckston Browne, F.R.C.S.

Henry Hallett Dale, C.B.E., M.D., Sec. R.S.
Director-in-chief of the National Institute for Medic[illegible] Research.

C.S.I.

Colonel John Philip Cameron, C.I.E., I.M.S.
Late Inspector-General of Prisons, Madras.

C.I.E.

Lieut.-Colonel John Morison, M.B., I.M.S.
Director of King Edward VII. Pasteur Institute and Medical Research Institute, Shillong, Assam.

C.V.O.

Marcus Antonius de Lavis-Trafford, M.V.O., O.B.E., M.D.
Physician-in-ordinary to the Duke of Connaught.

C.B.E.

Major Thomas John Hallinan, O.B.E., M.B.
Inspector-General of Health Services, Iraq.

O.B.E. (Military).

Surgeon Lieut.-Commander Andrew Lawrey, L.D.S.

O.B.E. (Civil).

Stanley Desmond Rieley, M.R.C.S.
Superintendent of Central Jail, Mach, Baluchistan.

Francis Alexander Innes, M.B., W.A.M.S.
Medical officer of health for Gambia.

Kaisar-i-Hind Medal.

William Nunan, M.D.
Police surgeon, and professor of medical jurisprudence at the Grant Medical College, Bombay.

PUBLIC HEALTH SERVICES

NNUAL REPORTS OF MEDICAL OFFICERS OF HEALTH.

HE following are 1930 statistics of Belfast, vcastle-upon-Tyne, and Cardiff.

Name of strict and stimated (R.-G.) nid-year pulation.	Birth-rate.	Death-rates per 1000 of the population.					Death-rates per 1000 births.		
		All causes.	Tuberculosis.	Cancer.	Respiratory diseases with influenza.	Heart disease.	Infant and neonatal mortality.	Young child (1–5 yr.) mortality.	Maternal mortality in childbirth.
fast .. .. (415.151)	22·7	12·9	1·41	1·12	2 1	2 0	78/34	31	4·5
vcastle-pon-Tyne.. (283,400)	18·4	12·6	1·30	1·39	1·8	2·3	74/34	30	5 4
diff .. .. (223,900)	16·9	11·4	1·15	1·34	1·4	2·1	72/36	22	5·3

Notified stillbirths per 100 live births: Belfast, 4·7. Registered stillbirths per 100 live births: Newcastle-uponne, 4·3; Cardiff, 4·9.

Belfast.

Dr. Charles S. Thomson records progress in aternity and child welfare work. The weekly ssions are to be increased from 6 to 19, 6 to be for itenatal work and 13 for infant consultations. ıe increase of the health visitors from 11 to 20 will able attention to be given to the pre-school child. Midwives are at present suspended for the purpose disinfection when any cases of puerperal pyrexia cur, and provision is needed for compensation in ich cases. The Nursing Home Act came into force January, 1930, and during the year 53 applications ere received, of which nine were refused.

About 8 per cent. of the milk samples are found to ontain tubercle bacilli, and Dr. Thomson advocates iat the municipality should only allow Grade A (T.T.) nd pasteurised milk to be supplied to infants and iothers under their scheme. A curious point has risen with regard to the notification of pulmonary iberculosis. Only those cases are notifiable in which here is "positive" sputum.

Dr. Andrew Trimble, tuberculosis officer, points ut that under the new regulations for insured ersons, which came into force on Oct. 1st, 1930, the anel doctor is instructed to report "suspected" ases of tuberculosis. But Dr. P. S. Walker, nedical superintendent of the sanatorium, points ut that the type of case admitted is even more dvanced than in previous years and that the anatorium is not equipped structurally or otherwise or advanced cases, although quite satisfactory as a anatorium. He points out that albumose or albumin s generally present in a positive sputum. It was only absent in nine out of 178 in recent examinations. He thinks that the presence of albumin in a negative sputum should be regarded as a reason for frequent examinations. He gives some interesting particulars with regard to pregnancy and tuberculosis. Out of 1113 pregnancies of tuberculous mothers, 63 ended in miscarriage, 17 in stillbirths, 13 in premature births, and 1020 in living full-term children. Of 1397 tuberculous mothers, 342 improved during pregnancy, 725 were in statu quo, 271 were in worse health, and 50 died within a year of delivery. The infant mortality-rate of 926 children born of 410 tuberculous mothers during seven years was 93, as compared with 102 for the general population. This agrees with the results obtained in Lancashire and Leeds, and may be due to the more careful supervision of these mothers.

The corporation pays £1000 annually to the maternity hospital (27 beds). A new maternity hospital, with 100 beds, is approaching completion within the grounds of the Royal Victoria Hospital. The Belfast Nursing Association employs 11 nurses for district work and receives no subsidy from the corporation. Dr. Thomson advocates an arrangement being made for the home nursing of measles and whooping cough by these district nurses.

There is great need of a large number of houses for the working classes. No fewer than 146 streets involving 3176 houses are known to the health department as requiring drastic treatment, and many new houses are required for these tenants. They are usually not in a position to pay the rent of the modern house, so that it is absolutely necessary to provide "kitchen" houses at low rents.

There are no private slaughter-houses in Belfast and over 5000 animals are slaughtered every fortnight at the municipal abattoir. A by-law for the compulsory use of the humane killer came into operation on March 19th, 1930.

Newcastle-upon-Tyne.

Dr. Harold Kerr says the hours of sunshine at Armstrong College were 1076, as against 1211 for the previous year, whilst near Morpeth the hours were 1323, as compared with 1566 in 1929. The city had therefore only three-quarters of the sunshine available for the neighbourhood. The regional committee for dealing with the smoke of Tyneside is without hope at present. The various gauges showed some improvement, probably owing to industrial depression. The citizens look forward to the advent of the "grid" and the abolition of the electric power station, with its three-fold deposit of ash. Smokeless fuel makes slow progress and Dr. Kerr and some medical confrères set an example by using gas-coke lit by gas burners, with a 10 per cent. advantage to their pockets.

As the result of the Local Government Act, 1929, the health committee took control of the poor-law infirmary, now called the Newcastle General Hospital; of the domiciliary medical service; of the care of boarded-out children; of poor children under 5 years; and of public vaccination. Progress has been made in the appointment of the new staff for the General Hospital and the redistribution of beds. Advanced pulmonary tuberculosis has been transferred to Walker Gate isolation hospital, for which a new pavilion will be needed. The top floor of the new block at the general hospital has been reserved for surgical cases of tuberculosis (72 beds). Already there is a shortage of beds at the general hospital and 200 more are needed. The public assistance committee controls the neighbouring institution and may remove elsewhere, thus releasing the institution for the use of the general hospital. Close coöperation is being maintained with the voluntary hospitals. The domiciliary medical service is likely to be converted to an open panel system, the patients to have their own choice of attendant and the health committee to be responsible for the dispensing of medicines. This system will be tried in about half the city, where there are vacancies at present and, if successful, will be applied to the rest of the town.

Diphtheria had again a low incidence. 200 cases with a case-fatality of 2·0 per cent., as compared with 259 in the previous year with a case-fatality of 5·4 per cent. Six Newcastle residents were affected by typhoid fever and 37 by paratyphoid B. Of 30 cases discovered in July and August, 21 had the same milk-supply. One carrier was found at the dairy but no suspicious circumstance at the supplying farms. The suspected milk was subjected to pasteurisation and subsequently the dairy has been registered for milk pasteurised according to the regulations. Dysentery was discovered in 87 persons, five of whom died. Two small outbreaks occurred in a children's ward of the general hospital, each caused by a different type of bacillus. Antitoxin was used for 43 per cent. of the scarlet fever cases admitted to hospital, and is thought to reduce the cases requiring operation by the oto-rhinologist. There were 82 notifications of ophthalmia neonatorum, three of which resulted in slightly defected vision. Owing to the development of tuberculosis in a member of the Walker Gate staff, radiographic records are now taken of every nurse and maid employed, as a measure of protection both to the staff and to the committee.

The three new infant welfare centres have supplied a great need in the newer housing areas. Owing to a difficulty in securing health visitors a training course has been established in the health department. These subsidised pupils undertake to do their training, sit for examination, and remain for six months afterwards as health visitors. The successful ones have filled all the vacancies on the staff. The infant welfare and school medical services have been linked up and the records of the former are passed on with the school entrant.

Considerable alleviation of overcrowding is taking place. Since the war the housing committee has completed 5549 houses, as against 3297 by private enterprise. At the end of 1930 there were 1059 municipal houses in course of erection and provision has been made in the latest schemes for a small proportion of two-roomed houses for aged persons. The Act of 1930 has greatly facilitated progress with insanitary areas. The tenement by-laws are being vigorously enforced and the institution of proceedings in 88 cases, as compared with 198 in the previous year, indicates more compliance on the part of owners. During 1930 caravans were reduced in number from 22 to 5. All the eight swimming baths have been equipped with a continuous system of filtration and aeration. The kata-thermometer is used for testing the ventilation of cinemas and theatres. The standard adopted is that the cooling power should not be below six by the dry, nor below 18 by the wet kata-thermometer. Of the buildings tested 28 proved first-class and eight second-class.

Cardiff.

Dr. R. M. F. Picken says the health of Cardiff does not appear to be materially affected by the trade depression of the last ten years. Some significance may be attached to the greater proportion of school-children found to be suffering from defects and to an increase in ailments found among expectant, parturient, and nursing mothers at the clinics. It is satisfactory, he says, that tuberculosis—that sure measure of extreme hardship—shows no upward tendency. The absence of gross deficiency is a tribute to the efficiency of the various methods of public assistance.

On April 1st the city council took over the work of the poor-law authority, whose area extended beyond the city boundaries. The poor-law institutions were transferred on the understanding that a proportion of the accommodation would be available for the county. The hospitals were not separate from the institutions, but their control has been unified by the appointment of the medical officer of health as medical officer for public assistance. On the other hand, Llandough hospital (340 beds), which was in course of construction by the guardians, has been allocated to the health committee as a general hospital.

Diphtheria continued to be prevalent. The notified cases were 731, as compared with 735 in the previous year; and the case-mortality was 3·97 per cent. Owing to this increased prevalence a special effort was made to immunise as many children as possible during the summer, a medical officer, a nurse, and two clerks being told off for the campaign. Over 4000 children were immunised, at a cost of *3s. 7½d.* per child. A table is given, showing the percentage of children at each age-period, who are presumed to be immune, in order to arrive at some measure of the influence of this effort upon the incidence of diphtheria in 1931 and subsequent years. Among the 42 notified cases of ophthalmia neonatorum no damage to eyesight was reported. The arrangement in 1929 made for the home nursing of pneumonia by the Queen's nurses was continued and 66 cases were referred to them during the year. Out of 322 cases of scarlet fever admitted to hospital, 52 received injections of scarlet fever antitoxin. The hospital mortality among 92 cases of measles was 5·4 per cent.

Dr. C. J. McSweeney gives an account of the work of the Lord Pontypridd Hospital, reserved for the treatment of children suffering from early rheumatism, which deserves wide publicity. The children admitted numbered 115, varying in age from 5 years to 14. An effort is made to exclude children with established heart disease, but in some cases valvular disease may have developed during the wait for beds, and it is the practice also to give the child the benefit of the doubt. During the year five children, classified on admission as having established valvular disease, lost all signs of it, whilst four others were regarded on discharge as presenting only minor cardiac manifestations. Among 100 cases treated to a conclusion in 1930 the proportion of normal hearts was raised from 15 to 60. The recovery-rate would have been higher still if every case of active carditis could have been admitted immediately on ascertainment. On two years' experience Dr. McSweeney estimates that 35 beds would be a reasonable provision instead of the 24 available. It was possible to obtain a reliable family history in 98 instances and in the case of 44 of these a history of juvenile rheumatism in a parent was unequivocal; and among these 98 children, 28 had one or more brothers or sisters afflicted with definite juvenile rheumatism. Generally speaking, Dr. McSweeney says, recurrences have been slight and brief, but it is, of course, far too early to express a definite opinion as to the permanency of results.

To prevent risk of urticaria to bathers (THE LANCET, 1930, ii., 752), Roath Park Lake was treated in March, when a third full, with a solution of 1 in 500,000 of copper sulphate. Towards the end of June the cercariæ were becoming numerous in the water-snails examined and there were a few complaints of skin eruption. The lake was again treated and bathing proceeded until the end of the season without further complaints. A case of lead-poisoning attributed to cider, drawn from a cask through a lead pipe, has come to the notice of the Welsh Board of Health, and Mr. S. Dixon, the public analyst, has made appropriate recommendations.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED DEC. 26TH, 1931.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 32 (last week 44); scarlet fever, 1303; diphtheria, 744; enteric fever, 36; pneumonia, 1180; puerperal fever, 33; puerperal pyrexia, 69; cerebro-spinal fever, 29; acute poliomyelitis, 7; acute polio-encephalitis, 2; encephalitis lethargica, 10; dysentery, 28; ophthalmia neonatorum, 61. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on Dec. 29th–30th was as follows: Small-pox, 75 under treatment, 1 under observation (last week 80 and 0 respectively); scarlet fever, 1401; diphtheria, 1499; enteric fever, 9; measles, 597; whooping cough, 435; puerperal fever, 18 (plus 11 babies); encephalitis lethargica, 223; poliomyelitis, 3; "other diseases," 240

(*Continued at foot of opposite page.*)

CORRESPONDENCE

ESEARCH IN ASTHMA: THE URINARY PROTEOSE.

To the Editor of THE LANCET.

R,—In a letter published in your columns on , 5th, 1931, Dr. G. H. Oriel made reference to e work recently carried out at the Asthma Clinic, 's Hospital, using a "proteose" prepared by from the urine of a patient with hay-fever ma. At the outset of the work in question I, onally, was quite as sceptical regarding the ns made for this preparation as Dr. Freeman ld still appear to remain. Positive erythema wheal reactions were, however, obtained and rded by slide tracings in the high proportion of s indicated. The only conclusion appeared to that the urine in question contained antigens t least haptene substances derived in some manner n the pollen protein which caused the patient's icks.

he presence of such derivatives in the urine of viduals with marked states of protein hyper- sitiveness is not unlikely, in view of the conclusive nonstration by "precipitin" tests that skin cting substances are excreted in the urine during ere reactions to bacterial infection, notably by pneumococcus.[1] It is to be hoped that eventually lence other than that provided by the skin test l enable a definite decision to be reached in the non- terial cases.

he production of an ether-urine emulsion which ms the first stage of Dr. Oriel's procedure in the paration of his rather ill-termed "proteose" ears to involve the concentration at the emulsion erfaces of every substance which happens to be sent in urine in a colloidal form. Subsequent atment of the viscid emulsion layer with alcohol ves to precipitate such substances as have collected the interface in an aggregated form, suitable for ther extraction and purification, but may also olve partial or complete denaturation of any tein matter present, while leaving comparatively affected the simpler haptene substances known to be rived from bacterial breakdown.

It is not surprising therefore that, quite apart from e dermatological considerations raised by Dr. H. W. Barber, the skin test demonstration with this urinary colloidal material very frequently fails in those cases of hypersensitiveness which appear to be associated with inhaled or ingested protein.

I am, Sir, yours faithfully,

E. T. CONYBEARE.

Osler Medical Clinic, Johns Hopkins Hospital,
Baltimore, Maryland, Dec. 21st, 1931.

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[1] Avery, O. T.: Acute Lobar Pneumonia: Prevention and um Treatment. 1917. Rockefeller Institute for Medical search. Monograph No. 7, p. 30.

PROTEIN IN ASTHMA.

To the Editor of THE LANCET.

SIR,—Dr. Behrman has pointed out (Dec. 26th, p. 1433) an apparent omission in the paper by Dr. Porter and myself which possibly we should have explained in the original. It is, however, impossible to include notes of all precautions taken without the risk of becoming tedious. We considered this question very carefully and decided that the cases themselves formed their own controls. For we could not produce any effect on a given case until we struck the right dose for that case. Also, I would point out that the type of case dealt with is more or less immune to psychological effect of a "new" treatment. They, poor things, have had so many without result. And we were careful *not* to give any suggestion of a marvellous cure. Further, although I must agree that, especially in a mild asthmatic, there *may* be a nervous factor usually associated with the time of onset of attack, the allergic state in an advanced asthmatic is in no way dependent on the nervous system.

But I may take this opportunity of mentioning to Dr. Behrman and others that one of my assistants has obtained a mild effect with proteins in epilepsy. *Not* a marked effect. And I should be grateful if someone in touch with a larger number of epileptics would make some attempt further to study this effect. Apparently the dose is considerably higher than in asthma.

Dr. Porter has not seen this letter for he is out of England. I am, Sir, yours faithfully,

THOMAS NELSON.

Grosvenor-street, Mayfair, W., Dec. 30th, 1931.

A NEW METHOD OF APPROACH TO THE SEMILUNAR CARTILAGES OF THE KNEE-JOINT.

To the Editor of THE LANCET.

SIR,—Mr. Timbrell Fisher's choice of this title for his note on the combined anterior and posterior approach to the semilunar cartilages (THE LANCET, Dec. 26th, 1931) is not fortunate, for the procedure is familiar to most orthopædic surgeons in this country; thus, amongst others, I myself have practised an identical technique for the past eight years in exceptional cases of cartilage injury. It is true that little has been written on the combined approach, but if any name, or combination of names, is to be attached in future to this operation, that of the late Alwyn Smith of Cardiff must come first. Alwyn Smith's advocacy of the combined approach can be found in the Journal of Bone and Joint Surgery (April 1925), and again in his contribution to the Robert Jones Birthday Volume (Oxford University Press, 1928), an essay written with indomitable courage during the long crippling illness which carried him from our midst. I am, Sir, yours faithfully,

Manchester, Dec. 30th, 1931. HARRY PLATT.

(*Continued from previous page.*)

St. Margaret's Hospital there were 10 babies (plus 5 thers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including ndon, there were no deaths from small-pox, 3 (0) om enteric fever, 39 (8) from measles, 3 (2) from arlet fever, 46 (5) from whooping-cough, 26 (2) from htheria, 43 (11) from diarrhœa and enteritis under o years, and 140 (19) from influenza. The figures parentheses are those for London itself.

Eight of the fatal cases of measles were reported from oke-on-Trent and 11 from Manchester. Whooping-cough counted for 10 deaths in Liverpool, 5 in Birmingham, d 3 in Hull. Five of the deaths from diarrhœa and ritis were notified from Liverpool. Fourteen of those tributed to influenza were in Manchester, 9 in Liverpool, in Birmingham, and 5 each in Bury, Birkenhead, and alford.

he number of stillbirths notified during the week as 197 (corresponding to a rate of 47 per 1000 total irths), including 27 in London.

PROGNOSIS IN LEUKÆMIA.

To the Editor of THE LANCET.

SIR,—So many conflicting statements have been made on the expectation of life in myeloid and lymphatic leukæmia, that I am anxious to obtain more information on this point than my own series of 127 cases affords. This is not usually available from the records of hospitals, many cases having been discharged to the care of their own medical attendant.

I write, therefore, to ask the help of your readers in this matter and to say that I should be very grateful for a brief note on any case that may have come under their observation, mentioning the type of leukæmia, age, and sex of patient, and the duration of life after the diagnosis had been made. I should also like to know whether treatment has included the use of X rays or not.

I am, Sir, yours faithfully,
A. KNYVETT GORDON.

Bedford-square, W.C., Jan. 4th, 1932.

THE ÆTIOLOGY OF "MALTA FEVER."

To the Editor of THE LANCET.

SIR,—With reference to the mention of my name in your journal of Dec. 19th, 1931, the only bacteriological equipment which I received from the then Medical Director-General consisted of air-tight glass chamber incubators in which sterilised agar-agar plates were kept; the sterile gelatine was inoculated with the blood of the patients in Bighi hospital suffering from so-called Malta fever. I made an arrangement with the hospital authorities, that whenever a patient died from that disease I should be sent for, day or night, to get a specimen of the blood and inoculate the sterilised gelatine; the plates were then put into an incubator, where the samples of the micrococcus spread, and were then examined under a high power microscope. As regards receiving apparatus from the Government authorities, the amount was small; it did not include a high power microscope. I personally purchased and paid for an oil immersion Zeiss microscope direct from Jena at a cost of 50 guineas.

If I read a foolish paper at the Epidemiological Society referring to the fever being due to the harbour water, my later work on the subject dealt only with the disease as being due to the micrococci extracted from blood immediately after death, with which the gelatine was inoculated. This refers to a period about 1889. I read a paper on the subject at a meeting of the Epidemiological Society in London, which was published in their journal; I hired 11 high power microscopes and gave a demonstration of the micrococcus cultures grown by me in sterilised agar-agar gelatine. This demonstration was given at the premises of the above society, using Zeiss oil immersion microscopes only.

I am, Sir, yours faithfully,
Lymington, Hants, Jan. 4th, 1932. A. G. P. GIPPS.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE.

Surg. Comdr. T. C. Patterson is placed on Retd. List with rank of Surg. Capt.

Surg. Comdr. to Surg. Capt.: G. F. Syms and S. Bradbury.

ROYAL ARMY MEDICAL CORPS.

To be Brevet Col.: Lt. Col. W. Benson.

To be Brevet Lt. Cols.: Majs. P. S. Tomlinson and J. M. Weddell.

E. McDonnell, late R.A.M.C., retires on retd. pay.

Col. J. W. West, late R.A.M.C., is placed on half pay.

Maj. T. H. Twigg is secd. for serv. under the Coloni Office.

Lt. H. E. Knott to be Capt.

Lt. F. G. Brown relinquishes his temp. commn.

A. A. Pullar is granted a temp. commn. in the rank of L

ARMY DENTAL CORPS.

Capt. N. H. Medhurst to be Maj.

TERRITORIAL ARMY.

Majs. A. Leggat and E. W. Matthews to be Bt. Lt.-Co

Capts. J. E. Rusby, C. F. Mayne, and O. G. Misquith be Bt. Majs.

Lts. S. G. M. Lynch and J. R. Wright to be Capts.

J. Simpson to be Lt.

INDIAN MEDICAL SERVICE.

Capts. R. W. H. Miller, P. A. C. Davenport, R. T. Adva and W. C. McKee to be Majs.

ROYAL AIR FORCE.

Flight Lts. to be Honorary Squadron Leaders: J. Skeet and A. W. Comber.

Dental Branch: Ernest Sharp is granted a non-perman commission as a Flying Officer.

ROYAL AIR FORCE RESERVE.

Flight Lt. to be Honorary Squadron Leader: T. Walker.

HONORARY SURGEON TO THE KING.

The King has approved the appointment of Air V Marshal John McIntyre, *M.C.*, as an Honorary Surgeon His Majesty, vice *Group-Captain* Henry Cooper, *D.S* who vacates the appointment on retirement from the Ro Air Force.

OBITUARY

NICOL RANKIN, M.C., M.B., Ch.B. Glasg.

WE regret to announce the death of Dr. Ni Rankin at the early age of 47, which occurred Dec. 31st, 1931. He had already established high reputation in London in his special departm of medicine, and his untimely death has cut sh a promising career.

Nicol McNicoll Rankin received his medical edu tion at the University of Glasgow, where he gradua as M.B., Ch.B. in 1908. He was a successful stud and after graduation served both as house physic and house surgeon at the Glasgow Royal Infirma and held resident posts also at the Western Infirma Appointed registrar to the Central London Thr Nose and Ear Hospital, he was serving in this capa at the outbreak of the war, when he joined up regimental duties with the Buffs (East Kent R ment). Here he inspired sentiments of respect affection in so marked a way that the unusual hon was bestowed upon him of election to the Regime Association, membership of which is usually reser for regular army officers. Rankin won the Milit Cross by a conspicuous act of bravery, contin to attend the wounded and dress their injuries un a heavy barrage, after he had himself receive severe wound in the face.

At the close of the war Dr. Nicol Rankin appointed assistant surgeon to the Central Lon Throat and Ear Hospital, and a few years l became full surgeon, and enjoyed at this inst tion just repute as a clinical observer, an opera and a teacher. He had the confidence of his colleag and the students associated with him, while essential qualities were reinforced by a vein Scottish humour which made him a genial compan Much sympathy is felt for his widow and yo family.

BENJAMIN W. THOMAS, M.R.C.S. Eng., L.R.C.P. Lond.

The death took place at his house in Welwyn on Dec 27th, 1931, of Dr. Benjamin Wilfred Thomas, n his seventy-third year.

Dr. Thomas was the son of Dr. Benjamin Thomas f Llanelly, and was educated at Epsom College, whence he proceeded as a medical student to Charing Cross Hospital, where he filled the house appointments. He was for a time surgical registrar and chloroformist to the Royal Orthopædic Hospital, and ook up general practice in 1888 in Welwyn, where he continued to practise for 40 years, retiring owing to ill health in 1928. His work was continued with assiduity until this date, in spite of the fact that in 1916 and again in 1917 he underwent operations for cataract. Of this remarkable triumph over a serious physical disability he was rightly proud.

MEDICAL NEWS

University of London.

At recent examinations the following candidates were successful —

M.S.

Branch I. (Surgery)—* P. B. Ascroft, Middlesex Hosp.; A L Light, Univ. of Leeds, D. W. C. Northfield, Guy's Hosp, K H. Watkins, Univ. of Manchester, and Philip Wiles, Middlesex Hosp.

* University medal.

Branch IV. (Laryngology, Otology, and Rhinology)—C. A. Amesur, St. Thomas's Hosp, and T D. Deighton, St. Bart's Hosp

Forthcoming Lectures.—Eight lectures on the Use of X Rays in Physiological Investigations will be given in the Physiological Theatre at Guy's Hospital, S.E., at 5 P.M. on Jan. 18th and 25th (Prof. J. M. Woodburn Morison); Feb 1st and 8th (Prof. H. A. Harris); Feb. 15th and 22nd (Dr. A. E. Barclay); and Feb 29th and March 7th (Dr. A. F. Hurst)—Three lectures on Serological Studies of Vaccinia will be given by Dr. W. J. Tulloch, professor of bacteriology in the University of St. Andrews, at St. Thomas's Hospital at 5 30 P.M. on Jan. 18th, 19th, and 20th.—The course on Genetic Principles in Medicine and Social Science will be continued during the Lent term by Prof. Lancelot Hogben at the London School of Economics at 5 P.M. on Fridays from Jan. 15th.—Mr. H. R. Ing, D Phil., will give six lectures on Chemotherapy at University College at 5 P.M. on Tuesdays from Jan. 19th.—Dr. S. J. Cowell, professor of dietetics in the University, will give four lectures on Modern Aspects of Nutrition at Bedford College at 5.15 P.M. on Wednesdays from Feb. 3rd to 24th.—Three lectures on the Feeding and Nutritional Disease of the Infant will be delivered by Prof Leonard Findlay at St. Bartholomew's Hospital Medical College at 5 30 P.M. on Feb 8th, 9th, and 12th.—Dr A. J. Clark, professor of materia medica in the University of Edinburgh, will lecture on the Reaction between Drugs and Cells at University College at 5 15 P.M. on Feb 26th and 29th and March 1st.

A list of advanced lectures and practical courses in physiology to be given during the present session may be had from the Academic Registrar.

Society of Apothecaries of London.

At recent examinations the following candidates were successful.—

Surgery—G. A Dickson, Univ of Sheffield; W. Hertzog, Guy's Hosp, W. B Mattar, St Mary's Hosp.; C Morgan, Charing Cross Hosp; and B Rivlin, Middlesex Hosp.

Medicine—F. Crowther, Guy's Hosp; H. T. Giblin, St. Mary's Hosp., R. F. Hawke, London Hosp, W. W. Parry, Guy's Hosp, S Ramarao London Hosp., B Shapiro, Universities of Moscow and Witwatersrand, E Teplitzky, Univ. of Berne and St. Mary's Hosp, E O Watson, St. Bart.'s Hosp.; and H A. T. Wells, Guy's Hosp

Forensic Medicine—J. H. Beale, Universities of Oxford and Sheffield, F Crowther, Guy's Hosp; H. T. Giblin, St Mary's Hosp; J Irger, Univ. Coll. Hosp., V. R. O. Lahanmi, Univ. of Manchester, R. Perkins, St Bart's Hosp, and H A T. Wells, Guy's Hosp.

Midwifery—G A Dickson, Univ. of Sheffield, R N. Gillespie Royal Free Hosp, R F Hawke, London Hosp, A A Kahn, Med Coll, Calcutta, E J. Littledale, Guy's Hosp, A J McBrearty, Queen's Univ, Belfast, and J. T Moohala Israckel Queen's Univ, Belfast

The following candidates, having completed the final examination, are granted the diploma of the Society, entitling them to practise medicine, surgery, and midwifery.—H T. Giblin S Ramarao R N Gillespie, E O. Watson, C Morgan, and H A T Wells

Royal College of Surgeons of England.

This month Sir Arthur Keith will give six Hunterian lectures entitled Malformations of the Human Body considered from a New Point of View. They will be delivered in the theatre of the College, at 5 P.M., on Mondays, Wednesdays, and Fridays, from Jan 18th to 29th, inclusive, and will be illustrated by specimens from the museum.

Board of Control.

On the retirement of Mr. O. E. Dickinson, the Board of Control have appointed Mr. P. Barter to be their secretary, and Mr. W. Fairley to be assistant secretary.

Medical Society of Individual Psychology.

The annual dinner of this society will be held at The Florence Restaurant, Rupert-street, London, W., on Thursday, Jan. 14th, at 7.15 for 7.30 P.M.

West London Medico-Chirurgical Society.

At a meeting of this society, to be held at the West London Hospital to day, Friday, Jan. 8th, at 8 30 P.M., Mr. Malcolm Donaldson and Prof. A. Piney will open a discussion on the Treatment of Carcinoma.

The "Chinese Medical Journal."

The *National Medical Journal of China* has now combined with the *China Medical Journal*, and from now onwards will be issued monthly under the new title of the *Chinese Medical Journal*. It will be the only medical journal published in China in the English language. Its address is: National Medical Association Building, Tzepang and Avenue-roads, Shanghai.

Winter in England.

As announced in our last issue, a meeting of those interested in the development of British coastal health and holiday resorts will be held at the Institute of Hygiene, 28, Portland-place, London, W.1, at 3.30 P.M. on Monday next. Lord Riddell will take the chair, and the objects and methods of a proposed British Seacoast Association will be described by medical and other speakers. The hon. secretary, Miss Herz, may be addressed at the institute.

Congress of Sanitary Science.

The third Congrès International de Technique Sanitaire et d'Hygiène Urbaine will be held at Lyons from March 6th to 9th The principal subjects of discussion will be the hygiene of transport, habitations, and places of assembly; hospitals; social work; atmospheric pollution; disinfection; and industrial hygiene. Further information may be had from Dr. Garin at the offices of the Congress, Rue Menestrier, Lyon, France.

Order of St. John of Jerusalem.

The King has sanctioned the following promotions in and appointments to the Venerable Order of the Hospital of St. John of Jerusalem:—As Officers: Maj-Genl. W. V. Coppinger, Lt. Col. J. S Purdy, Maj. A. B. Cardew, Col. A. M. Connell, Dr. G. J Linklater, and Dr. R. Owen. As Associate Officer: Lt. Col. H. Suhrawardy. As Serving Brothers Dr. R. V. Clayton, Dr. F. S Hardy, Dr F. W. M. Palmer, Dr. L L. Westrope, Dr. W. Mailer, Mr. O. A. Ehrmann, and Dr. E S B. Hamilton.

Appointments

BROWNE F W, M B Oxon, has been appointed Medical Officer to the Post Office, Bristol

Vacancies

For further information refer to the advertisement columns.

Barnsley, Beckett Hospital and Dispensary—Cas O £250
Beckenham, Kent, Bethlem Hospital, Monks Orchard—Res H P. At rate of £150
Birmingham, Little Bromwich Hospital for Infectious Diseases—Jun Asst. M O. £300
Birmingham Maternity Hospital—Res M O £200
Bolingbroke Hospital, Wandsworth Common, S W.—H.P. At rate of £120.
Bradford Royal Infirmary—Res Surg O. £225
Brighton, Royal Sussex County Hospital—H S £150.
Cambridge, Papworth Village Settlement—Third Asst. M O. £200.
Cardiff, Welsh National School of Medicine—Demonstrator in Pathology and Bacteriology. £250
Carlisle, Cumberland and Westmorland Mental Hospital—Jun. Asst M O £350.

Central London Ophthalmic Hospital, Judd-street, St. Pancras, W.C.—Sen. and Jun. H.S.'s. At rate of £120 and £100 respectively.
[illegible] *Derbyshire Royal Hospital.*—H.S. £150. [illegible] 50.
[illegible] tologist.
[illegible] —H.S. At rate of £150.
Evelina Hospital for Children, Southwark, S.E.—H.P. At rate of £120.
Glasgow Corporation.—P.H. Dept. Pathologist. £800.
Guildford, Royal Surrey County Hospital.—H.S. £150.
Hampstead General and N.W. London Hospital, Haverstock-hill, N.W.—H.P. At rate of £100.
Hertford County Hospital.—H.P. At rate of £150.
Hospital for Consumption and Diseases of the Chest, Brompton, S.W.—H.P. and H.S. Each at rate of £50.
Hove Hospital, Sackville-road.—Res. M.O. £200.
Huddersfield Royal Infirmary.—Res. Surg. O. At rate of £225. Also H.S. At rate of £150.
India, British Empire Leprosy]Relief Association.—Medical Man. Rs.1000 to Rs. 1200 per mensem.
Kingston-upon-Hull, Anlaby-road Institution.—Asst. M.O. £300.
Liverpool and Samaritan Hospital for Women.—Hon. Asst. Surgeon.
Liverpool, David Lewis Northern Hospital.—Four H.S.'s and Two H.P.'s. Each at rate of £100.
Liverpool, Royal Children's Hospital.—Second Res. M.O. for Heswall Branch. At rate of £120.
L.C.C.—Asst. M.O.'s for Panel School Medical Work. 30*s.* per session.
Manchester, St. Mary's Hospitals.—Four H.S.'s and Jun. Asst. M.O. All at rate of £50.
Margate, Princess Mary's Hospital for Children.—Res. Med. Supt. £950.
Mile End Hospital, Bancroft-road, Mile End, E.—Asst. M.O. £350.
National Hospital, Queen-square, W.C.—Hon. Surg. Asst.
Newcastle General Hospital, Newcastle-upon-Tyne.—Res. Med. Assts. Each at rate of £150.
Northampton General Hospital.—Hon. Ophth. Surgeon.
North Middlesex County Hospital, N.—Res. Asst. M.O. £400.
Norwich, Norfolk and Norwich Hospital.—H.S. Also Cas. O. and H.S. Each £120.
Queen's Hospital for Children, Hackney-road, E.—Surg. to Ear, Nose, and Throat Dept.
Retford, Notts, Rampton State Institution for Mental Defectives.—Med. Supt. £1000. Also Fourth M.O. £400.
St. Alfege's Hospital, Vanbrugh Hill, Greenwich, S.E.—Asst. M.O. £350.
St. John's Hospital, Lewisham, S.E.—Res. H.P. and H.S. Each at rate of £100.
St. John's Hospital, St. John's Hill, S.W.—Asst. M.O. £350.
St. Mary Abbot's Hospital, Marloes-road, Kensington.—Asst. M.O. At rate of £250.
St. Peter's Hospital for Stone, &c., Henrietta-street, Covent Garden, W.C.—Anæsthetist. £25.
Sheffield, Children's Hospital.—H.P. and H.S., and Cas. O. At rate of £100 and £80 respectively.
Sheffield Royal Infirmary.—Ophth. H.S. At rate of £80.
Victoria Hospital for Children, Tite-street, Chelsea, S.W.—Hon. Surg. Reg. Also H.P. and H.S. Each at rate of £100. Also Out-patient Anæsthetist. 10*s.* 6*d.* per attendance.
Warrington Infirmary and Dispensary.—Sen. and Jun. H.S.'s. £225 and £175 respectively.

The Chief Inspector of Factories announces vacancies for Certifying Factory Surgeons at New Southgate (Middlesex) and Falmouth (Cornwall).

Medical Diary

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

Tuesday, Jan. 12th.—5 P.M., THERAPEUTICS AND PHARMACOLOGY. 4.30 [illegible] Oxygen Apparatus. Paper: Prof. [illegible] Uses of Oxygen in Medicine. [illegible] G. Douglas and Dr. R. Hilton. 8.30 P.M., PSYCHIATRY. Cinematograph Demonstration. Dr. Noel H. M. Burke: Some Aspects of Mental Deficiency.

Wednesday.—5 P.M., SURGERY: SUB-SECTION OF PROCTOLOGY. Cases: Mr. W. S. Perrin: 1. Chordoma. Mr. L. E. C. Norbury: 2. Extensive Prolapse of Rectum. Specimens: Mr. Ernest Miles: 1. Recurrent Procidentia Recti with Diverticulosis. 2. Secondary Sarcoma of Pelvic Colon. Mr. L. E. C. Norbury: 3. Endothelioma of Rectum. Mr. W. B. Gabriel: 4 and 5. Carcinoma of Cæcum. Mr. Lawrence Abel: 6. Myxo-fibroma of Small Intestine. 7 and 8. Lipoma of Large Intestine. 9. Fibroma of Anterior Surface of Cæcum. Mr. Naunton Morgan: 10. Carcinoma Simplex of Rectum. 11. [illegible] Rectum. Other cases and specimens [illegible] per: Mr. Lawrence Abel: The [illegible] by coloured cinematograph film).

Friday.—5.30 P.M., PHYSICAL MEDICINE. Paper: Mr. G. C. Simpson, D.Sc. (Director of Meteorological Office): Meteorological Factors which may Affect Health. 8.15 P.M., OBSTETRICS AND GYNÆCOLOGY. Specimens: Mr. T. G. Stevens: 1. Rhabdosarcoma of the Cervix. Mr. L. Carnac Rivett: 2. Foreign Body Found in the Intestine after Cæsarean Section Ten Years Previously. Paper: Prof. E. C. Dodds: The Bearing of Recent Research on the Sex Hormones on Clinical Obstetrics and Gynæcology. Discussion: Speakers: Prof. A. S. Parkes, Dr. H. Gardiner-Hill, and Dr. B. P. Wiesner. 8.30 P.M., RADIOLOGY. Discussion: Some Physical and Medical Aspects of X Ray D[illegible] Mr. W. V. [illegible] Radiation [illegible] Old and N[illegible] in Cancer. [illegible] Disease. Followed by Dr. A. Burrows, Dr. Goldsborough, Prof. Hopwood, Dr. J. E. Lynham, Dr. G. Scott, Dr. J. Webster, and others.

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W.1.

Monday, Jan. 11th.—8 P.M., Pathological Meeting.

HARVEIAN SOCIETY OF LONDON.

Thursday, Jan. 14th.—8.30 P.M. (at the Paddington Town Hall, W.). Annual general meeting. Presidential address by *Sir Thomas Horder.*

SOCIETY OF MEDICAL OFFICERS OF HEALTH.

Friday, Jan. 15th.—5 P.M. (at 1, Upper Montague-street, [illegible]) Discussion on Causes of the [illegible] Mortality, opened by Dr. [illegible] Ernest Ward.

SOCIETY FOR THE STUDY OF INEBRIETY.

Tuesday, Jan. 12th.—4 P.M. (at 11, Chandos-street, W.). Discussion on Mental Defectiveness and Alcohol and Drug Addiction. Opener: Dr. W. Norwood East.

BRITISH INSTITUTE OF RADIOLOGY, 32, Welbeck-street, W.

Thursday, Jan. 14th.—8.30 P.M., Further discussion of Dr. Ffrangcon Roberts's paper on the International Protection Recommendations.

Friday.—Morning visit to the Research Department, Woolwich.—5 P.M., Discussion on Bone Tumours. (Opener: Dr. James Brailsford.)

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

Monday, Jan. 11th, to [illegible].—MEDICAL SOCIETY OF LONDON [illegible] W., Monday, 8.30 P.M., Dr. W. L[illegible] Endocrines and the Sympathetic Nervous System. (First of six lectures on Endocrinology. Fee.) Wed., 4 P.M., Dr. E. H. R. Harries: Modern Treatment of Common Infectious Diseases. (First of nine lectures on Treatment. Fee.) Syllabuses from the Fellowship.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith, W.

Monday, Jan. 11th.—10 A.M., Gynæcological Wards [illegible] Genito-urinary Op[illegible] 11 A.M., [illegible] Medical Surgical Wards. [illegible] Surgical, Eye, an[illegible]

Tuesday.—9.30 A.M., [illegible] Ward Demonstration; [illegible] A.M., Throat Operations. 11.30 A.M., Surgical Demonstration. 2 P.M., Operations; Medical, Surgical, and Throat Out-patients.

Wednesday.—10 A.M., Medical Wards; Children's Medical Out-patients. 2 P.M., Medical, Surgical, and Eye Out-patients. 2.30 P.M., Gynæcological Operations. 4.45 P.M., Venereal Diseases Demonstration.

Thursday.—10 A.M., Neurological Department. 11.30 A.M., Fracture Demonstration. 2 P.M., Medical, Surgical, Eye, and Genito-urinary Out-patients. 2.30 P.M., Operations.

Friday.—10 A.M., Medical Wards, Skin Department, Dental Department. 12 noon, Medical Lecture. 2 P.M., Operations, Medical, Surgical, and Throat Out-patients.

Saturday.—9 A.M., Throat Operations. 10 A.M., Medical Wards, Surgical and Children's Out-patients.

ST. MARK'S HOSPITAL, City-road, E.C.

Thursday, Jan. 14th.—4.30 P.M., Dr. J. Browning Alexander: Constipation and Obstipation.

KING'S COLLEGE HOSPITAL MEDICAL SCHOOL, Denmark-hill, S.E.

Thursday, Jan. 14th.—9 P.M., Dr. H. A. Lucas: Serum Treatment in Practice.

CENTRAL LONDON THROAT, NOSE, AND EAR HOSPITAL, Gray's Inn-road, W.C.

Friday, Jan. 15th.—4 P.M., Mr. J. D. McLaggan: Eczematous Condition of the Ear and Nose.

LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital, 49, Leicester-square, W.C.

Tuesday, Jan. 12th.—5 P.M., Sir E. Graham Little: Cicatricial Alopecia.

Thursday.—5 P.M., Dr. W. J. O'Donovan: Stocking Erythroderma.

WESTERN INFIRMARY, Glasgow.

Wednesday, Jan. 13th.—4.15 P.M., Dr. George A. Allan: Medical Cases.

NOTES, COMMENTS, AND ABSTRACTS

PREVENTIVE MEDICINE IN ITS RELATION TO AVIATION.

By E. Goodwin Rawlinson, M.D., D.P.H.,
DIRECTOR OF THE BACTERIOLOGICAL DEPARTMENT, ROYAL INSTITUTE OF PUBLIC HEALTH.

Air transport has now become so important a factor in the life of the community that preventive medicine must seriously take into account the new problems that inevitably have arisen.

The Pilot.

Medicine in aviation has naturally, up to the present, been chiefly concerned with the pilot. He is the keyman of all flying. His selection and fitness must always be the primary consideration, and examinations at fixed intervals by the same highly trained specialists are necessary to ensure that his efficiency is unimpaired; to note the influences and conditions under which he works. Everything that has a bearing, directly or indirectly, upon his flying health should be observed and rigidly supervised.

Many ingenious tests have been devised for this purpose, and in no other branch of medicine has the psychological side been so well stressed, and its importance so well appreciated as in the selection and care of the aviator.

The medical branch of the Royal Air Force has shown great resource and initiative in dealing with the various difficult problems with which it has been so violently faced, and the pioneer work of Flack, Stamm, Head, and many others,[1] necessarily sets a standard for medicine dealing with the pilot in civil aviation. Most of the pilots engaged in civil aviation transport have been trained in the Service and the system of short-term engagement makes it likely that this will be so for a considerable time to come.

The candidate to become a pilot in civil transport is finally examined at the Air Ministry in London. The medical examinations are carried out here by the same people, the same apparatus, under the same conditions, in the same atmosphere. It will be readily understood that, for such vital, stringent, and complex tests and such comparatively new work, the advantage of these being carried out always by the same personnel is great, and that it will be very difficult to delegate them to a decentralised authority. The value of impressions obtained, too difficult to define, the intuitive knowledge that must be gained, all tend to make this extremely personal and limiting. So too with such work still in its infancy, new devices and experiments are continually being elaborated, which could only be properly evaluated by those already steeped in the work.

The would-be pilot undergoes a super-insurance examination as to his family history, his personal habits, tastes, hobbies; his education and the minutiæ of his occupation since his school days. This being satisfactory, his selection will depend upon what are known as physical efficiency tests.[2] These are devised to determine the conditions of his cardiovascular system, respiratory capacities, vision, hearing, nervous and muscular reactions. To pass these tests he must prove to be a piece of perfect mechanism both mental and physical, with capabilities of unerring judgment. After a period of training, if satisfactory, he receives certificate B. (the public transport certificate). This must be renewed at six-monthly intervals after re-examination. A woman pilot holding such certificate is re-examined every three months.

The conditions of the pilot's work obviously are of the utmost importance and should come under the supervision and control of a competent authority—at present the Air Ministry. They have a vital effect on his efficiency, and the peculiar nature of his work is such that the easement of any arduous factor makes for safer flying.

The length of flying-time must be regulated, the periods of waiting must be considered; where must the pilot be housed during such periods of his employment, what must he do that he be not depressed—a condition fraught with trouble for pilots? His reaction to night flying should be noted.

The employing company cannot always appreciate that small and apparently trivial difficulties are vital in their reactions. The maker of the machines, in his engineering enthusiasm, unconsciously adds to the pilot's troubles by altering or adding controls, changing what has been an automatic reaction to an extraconscious action—a possible source of error in rapid judgment. The necessity for standard controls cannot be too strongly urged; and every effort should be made to lessen the number of instruments the pilot must watch—air speed indicator, altimeter, oil and petrol gauges, compass, &c.—and these tend to increase. So, too, everything that will minimise the result of an accident to him, such as the special padding of the cockpit, the automatic parachute, tends to give him a certain relaxation of the tenseness of expectancy.

These are all subjects that come under the purview of preventive medicine in aviation as well as a consideration of the length of a pilot's occupational life, the problem of his after career, and the assurance of more than a pittance when his comparatively short flying life is done. It must affect his efficiency if he has a conscious or a subconscious worry as to what is to become of his wife and family, in case of total disability, or—feeling a lessened vitality from a quickening staleness—as to the results of his next medical examination.

It must always be an axiom that the pilot (apart from the machine) is the paramount factor of flying.

The Passenger.

Air transport companies between Great Britain and the continent carried 48.253 passengers in 1929.[3]

AIR-SICKNESS.

There are no statistics available to show how many of the 48,253 suffered air-sickness, but it is stated to be not negligible. Apart from the mental bias to sickness and the unusual movement, probably four main factors tend to operate in the causation of this troublesome condition: poor ventilation, lack of warmth, noise, and vibration: the first being the most important. A reasonable altitude, per se, does not appear to have any bearing on sickness.

The problem of changing the air of the small cubic space allowed to each passenger is a difficult one. To change the air sufficiently often to keep it fresh means draughts. If draughts are prevented then the sense of "stuffiness" arises, due, as Leonard Hill[4] has shown, to lack of the removal of the air next the skin and enmeshed in the clothing.

The heating of the air presents some engineering difficulties. Air heated by contact with hot pipes leading from the exhaust may contain noxious gases and the possibilities of leakage. Humidity and warmth might be measured and controlled by passing air through steam.

The Handley Page 42-seater on the India route has a cubic capacity of approximately 4000 c. ft., giving slightly less than 100 c. ft. per passenger. Hot and cold air inlets are provided at each pair of seats. The *Argosy* on the Paris service, seating 20 passengers, gives about 54 c. ft. to each person. (This does not compare unfavourably with crowded suburban trains.) A room in a dwelling-house is required to have 1000 c. ft. space for each person.

We know from experience that continuous and particularly unusual noise is fatiguing; it is one of the problems of our mechanised age. The noise of the actual explosion of the cylinders of the engine may be reduced, but in so doing, Heald [5] has pointed out, the unpleasant screaming of the timing gears then become predominant. Vibration he also notes can become fatiguing, and thus may be a reflex cause of sickness. Exhaustive experiments in the sound proofing of aeroplane cabins are being carried out by different authorities.[6]

An investigation promoted by the Daniel Guggenheim Fund for the Promotion of Aeronautics [7] was concluded by the observation that few people are troubled by air-sickness in properly built and efficiently piloted aircraft.

Research carried out by Marrack,[8] as to a fundamental cause of sea-sickness, showed that ketosis occurred in nearly all subjects within 24 hours after vomiting commenced, but that it was incidental, and evidence of a metabolic change which itself may be the cause. According to Flack [9] the connexion between sea- and air-sickness appeared to be slight, though in cases where the labyrinth was unduly sensitive the subject would be both sea-sick and air-sick. Flack also noted that where the labyrinth did not seem to be involved, ocular muscle imbalance was the primary condition. Maitland,[10] in work carried out at the same time as both the above, observed that a passenger can only partially counteract a sudden, unexpected arrest of movement and a change of direction, by bodily adjustment; "the eye fails to pick up the datum levels, to rectify erratic information received by the semi-circular canals."

Much general experience goes to show that all subjects react very differently, as to the various factors which set up the impulse, and that different senses and functions are involved in different people.

DISPOSAL OF EXCRETA.

The Air Ministry regulations [11] at the present time prohibit the dropping of articles from the air, with certain exceptions, but the exceptions apply to excretal matter, a problem that requires urgent attention. It is almost safe to say that at the present time, when a passenger or a pilot urinates or defæcates whilst in the air, the excreta, liquid and solid, is simply allowed to scatter on the four winds of Heaven. This anachronism would never have been permitted had there been visible evidence. No palpable mass can be observed—the height at which it is released being sufficient to cause division into small particles or drops.

The layman will perhaps argue that such division and the exposure of the fine particles to wind, rain, and sun (particularly the sun) is all that can be desired to make such material harmless, although he probably would object on æsthetic grounds; and it may be argued by the more knowledgeable that the bacterial content of the healthy intestine is not of a disease-producing type and that those who are flying or travelling by air are the most likely to be of a healthy normal type. It has been estimated, however, that about 1 in 1000 of the population is a typhoid carrier [12]—apar tfrom other intestinal disease carriers—and there appears no reason why human carriers of the salmonella group of bacteria should not exist. The dysentery carrier cannot be absolutely disregarded, and on the air routes of Africa, Asia, and South America, dysentery, cholera, and helminth carriers are important, and can be contributors to disease broadcast in such a manner.

If the above estimate is right the Imperial Airways and other companies possibly transported 27 typhoid carriers in 1929. True, they may not all have defæcated or urinated whilst in the air, but it is certain that a proportion of them did so.

What happens to the finely divided particles? Each minute mass is attached to a droplet of moisture and the bacteria present are protected with a coating of fæcal matter from being killed by the sun's rays and the moisture present is necessary for their existence. In calm weather a gradual deposition takes place in the area in which it is dropped. In windy weather it is carried great distances: it may remain suspended in the air, wafted by slight currents; but whatever the weather or conditions there is every possibility of its being finally deposited or blown direct into an open water-supply, on to human food, or taken into the lung. Air routes pass over reservoirs and water-supplies, or in close proximity. Close or distant, the danger exists.

It may be said that we are accustomed to breathing in an atmosphere laden with bacteria among which are intestinal organisms, or that the possibilities of disease arising from aeroplane passenger traffic at present is very slight. But each year sees a larger number of people taking to air, each year the ends o the earth are brought closer, and where definit air routes are established in countries where intestina disease, such as dysentery and cholera, are bot endemic and epidemic, the increase in the dange becomes more marked.

Suggested measures.—There appear to be severa possible ways for dealing with excreta on aeroplane but the present design and construction of th machine is not such as to expect or allow elaborat weighty, or bulky mechanism for such purpose and sanitary authorities would be well advise to be satisfied with simple and possibly primiti devices at first.

For passenger-carrying machines a small, standar aluminium tank or box could be fitted in the lavato containing a small amount of disinfectant of high coefficie The tank should be of sufficient size to take the excre of half the number of passengers carried. The size necessa for ten people for a three to four hour journey would approximately 1½ gallons. (The amount of excreta 24 hours per person is taken as about 50 oz. of urine and average of 5 oz. of fæces.) The tank would be prefera of an ink-well pattern; a detachable funnel-top fitting i a cylindrical container with an incurved rim. Th would be replaced at the air-port by one of a stand pattern, and the used one emptied, disinfected, and prepa ready for use again.

A further development might be devised at a later dat a tank jacketted for steam, if such were available, or hot from the exhaust, by which the excreta would be rapi dried. This would necessitate an exhaust ventilat for fumes and perhaps a method of removing the dr material from the chamber, but if the heat generated sufficient to dry the material very rapidly, the tank wo have the advantage of a very small size and diminis weight of excreta.

A device for breaking down the solids by compressed and then rendering them innocuous before discharge into air would probably require too complex machinery practical use.

For a single-seater machine, a valved funnel arrangem could be planned with a plenum device for forcing the ma by air to a small tank at the rear of the fuselage.

Excreta taken from the machines at air-ports wo readily be dealt with where the air-port was favoura situated near a large town, but the establishm of air-ports in primitive surroundings would ne sitate the method of disposal best suited for the a

THE CARRYING OF DISEASE.

As civil aviation increases and internati boundaries become of lesser import, the utm stringency will be imperative to prevent epidem The Royal Air Force as a fighting force has con of all the units it carries, but in civil aviation probl arise with regard to the transport of units over w much less control can be exercised; unless, as poin out by Massey,[13] the very purpose of the speed aviation is destroyed.

It is now possible to travel half round the w whilst sickening for a disease. A man could d a typhoid-infected water in the Antipodes show no signs of it until after he had disembar from an aeroplane at Croydon. And though danger of the introduction of disease into this cour by aeroplane is not yet very great, each day bring a little closer to the subtropics and the tropics.

The danger of the spread of the yellow f mosquito across Africa by air travel has already b urged by James.[14] Draft regulations concerning pe of menace already exist and in some countries, ch as South America, are actually in force; coast-ise seaplane services along yellow fever regions ust land and embark passengers at a certain distance om shore.

As an Empire country we must necessarily envisage l the possibilities of the spread of tropical disease r air: cholera, dysentery, and plague, not only into is country, but from one Dominion to another. et is seems that our greatest immediate danger om this means is the introduction into, and the read in the British Isles, of influenza, the exanthe-ata and the diseases caused by filtrable viruses. n 1930 42,435 passengers were carried between the ontinent and Great Britain by air.[15] With the cursory upervision possible at present, how great a potentiality r these diseases in their incubation periods?

Without nullifying the very object of aviation, he control of communicable disease will prove to be ne of the most difficult problems preventive medicine as had to face. At present our quarantine is under he primary control of H.M. Customs and aeroplanes re cleared as ships. Unless blatantly ill no sick assenger would have much difficulty in evasion, nd virulent disease could land with little hindrance.

A bill of health from the port of embarkation has een suggested. This is already in force in certain ountries: often it may have little value. It will be eadily seen that a passenger hurried by car to the air-port with just enough time to embark (and this is not unusual) is somewhat perfunctorily examined. Also, different countries have not the same standards.

The possibilities of the future would seem to lie in the following directions:—

(1) Reorganisation of the quarantine service and its transfer, as far as aviation is concerned, to the Ministry of Health. At present aircraft in this respect are governed by maritime regulations. Conditions are so different it is self-evident that reorientation is inevitable.

(2) The employment of whole-time medical officers in such quarantine service, and the establishment of small quarantine hospitals at air-ports.

(3) An extension of the use of consular reports telegraphed as to the daily health at this official's station as well as the reports of the Office Internationale d'Hygiène Publique.

(4) The establishment of regulations of an elastic nature and subject to frequent revision.

(5) Immunisation preliminary to travel from epidemic areas.

Some of these points have been discussed by Holden.[16]

The knowledge that a close scrutiny of passengers was carried out on disembarkation would tend to deter a certain number of incubationary carriers. It may be possible at some future date to devise some rapid method of diagnosing "not quite wellness," because it is this state, or lack, of health that must almost always be considered in the aeroplane passenger.

It must be emphasised that authority should endeavour to carry out a measure of control, efficient and elastic, in order that the purpose and development of aviation be not hampered. Even under the best auspices there is no doubt that the more the extension of our freedom as to time and space, the more the restriction of our liberty, where the health of the community is involved. (The dangers of transmission of disease by aircraft apply to all forms of transport, and it would be reasonable, whilst setting this house n order, to give some attention to our far from rfect protection from the same type of disease on oss-channel boat traffic and in trains.)

Accidents.

Confidence in aircraft is becoming established. The number of accidents involving regular passenger traffic may be regarded as almost minimal. During the year 1929–1930, with the Imperial Airways one accident occurred and four persons were killed representing one killed per 360,000 miles flown or one killed for 6270 passengers carried.

On examining the causes of accidents, French figures[17] for 1923–1925 are available and the impressive fact emerges that out of 100 accidents the percentage of causes are in almost constant proportion—over half are due to faulty airmanship (errors of judgment) and less than one-quarter to engine failure. American statistics[18] bear this out. They show about 56 per cent. due, as they put it, to personnel, and 19 per cent. to power plant failure. Our own figures for 1929[19] are still higher, 70 per cent. due to errors of judgment (faulty pilotage). These figures emphasise very strongly the urgent necessity of considering no factor too trivial where the pilot is concerned.

All first-aid outfits on passenger machines should include large and small dressings, iodine or other antiseptic in ampoules, spirits of ammonia, and a dressing for burns. All air-ports should be equipped with a dressing station complete with emergency tools and fire extinguishers.

Surgery in connexion with aviation differs but little from that concerned with accidents generally: mainly in degree. Major injuries do not bulk so largely as might be expected. An admirable and interesting analysis of such accidents is given in a work by Graeme Anderson.[20]

Merchandise.

The carrying of merchandise in ships from foreign ports calls for the inspection of cargo for disease-carrying vermin such as rats which may be infested with plague, fleas, or actual carriers of this and other diseases. Cargo and ship must be disinfected: deratisation and measures for rat-proofing carried out.

The same applies, on a small scale at the present time, to merchandise carried in aeroplanes. Such traffic is still in an elementary stage: mail, gold, and precious stones are common air cargoes but with an extension of such traffic to include materials or foodstuffs, a search for parasites, rats, and insect pests will be imperative.

A new condition also arises to that obtaining in ship transport. The shortened period of the journey by aeroplane may allow arthropod disease-carriers to be landed alive in this country that would not otherwise have survived the longer period on a ship. Other insect pests, so introduced, might well have an economic importance in causing destruction of plant or cereal crops.

The entomologist has made use of the aeroplane in the search for and distribution of the natural enemies of similar pests; locusts and grasshoppers are sprayed from the air, in the effort to arrest their destructive progress. The sanitarian has been able to destroy mosquito larvæ over large tracts of country by spraying larvicides from planes.

Health Services.

The aeroplane has already proved of great value in countries where natural cataclysms frequently occur and where ordinary means of communication are destroyed. Rapid organisation of sanitary measures is an urgent necessity after earthquakes or great floods for first-aid work, to prevent epidemic disease, establish food- and water-supplies, and to rush chlorinating apparatus and disinfectants to the affected areas. The recent earthquake in New Zealand and the large flooded districts of the Mississippi are apt examples.

Mobile laboratories, portable X rays and operating units are not dreams of the future in aviation, but are either in being or on the way to reality. The ambulance aeroplane is a standard Royal Air Force equipment. Antitoxin has been hurried to Alaska; cultures of cholera vibrio have been brought from Basra by air to London for the preparation of vaccines to be returned in the same manner, to replenish depleted supplies during an epidemic.

The health services of the future also promise a use of aviation for therapeutics, metabolism is stimulated by flying—its tonic effect is marked: airmen have also noticed that the common cold reacts favourably to flights at high altitudes. But in a country like England where sunlight is so often infrequent one can foresee the possible establishment of sunlight clinics in the air—airships for altitude treatment of heart and respiratory diseases. Instead of prescribing a child a few minutes exposure to the sunlight lamp, we may be ordering a flight at such and such an altitude for half an hour. We have a Leysin directly over our heads all day and every day.

Finally, medicine is to gain from the meteorological research now being carried out on the strata of air at very high altitudes.

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HOCKEY INJURIES.

THE casualties at football in America, described by our correspondent from U.S.A. on p. 100, are more fatal and more serious than one would expect, even in the course of a violent game. That few disabling accidents follow hockey has recently been shown by Dr. A. Arnold,[1] of the medical department of the Leipzig University Institute for Physical Exercises. He has recently published his observations on injuries received at hockey in a paper based on their occurrence in 2152 games in which over 23,000 players took part. Like Dr. Glass,[2] who had made similar observations on sets of hockey players, Dr. Arnold classified the injuries into two groups according as the person affected was obliged to give up playing for from three to five minutes, or to abandon the game altogether. In men's teams the incidence of injuries was 0·35 per cent., in boys' teams 0·25 per cent., and in women's and girls' teams 0·34 per cent., or a total incidence of 0·33 per cent. In 38 per cent. the injury was caused by the hockey stick, and in 19 per cent. by the ball, while 43 per cent. were classified as due to indirect causes—i.e., not peculiar to hockey, but such as might occur in any sport—e.g., a fall or collision with another player. The frequency of injuries varied with the different groups of players. As regards the site of the injuries inflicted by the hockey stick the head was affected in 43 per cent., the lower extremities in 33 per cent., the upper extremities in 17 per cent., and the trunk in 7 per cent. of the accidents. The sites of the injuries inflicted by the balls showed a somewhat similar distribution. On the other hand, in injuries due to indirect causes the upper and lower extremities were most frequently affected. The duration of the incapacity caused by the injury was in most cases very short. Only three of the 30 players injured by the stick and only three of the 15 injured by the ball were unfit for playing for longer than a month. On the other hand, of 34 injured by indirect causes, 20 were still unable to resume playing after a month. Three had to give up hockey altogether—one from injury to the kidney and two from injury to the knee. Dr. Arnold comes to the conclusion that since serious injury seems to be rare, and the muscular movements which hockey calls into play are of great variety, the game should be recommended from the medical point of view.

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[1] Deut. med. Woch., Dec. 25th, 1931, p. 2175.
[2] Arch. klin. Chir., Bd. 184, p. 742.

COMPULSORY PASTEURISATION OF MILK.

THE Manchester public health committee has approved a memorandum from Dr. R. Veitch Clark, the medical officer of health, proposing that the city council should take powers to insist that all the milk supplied to the city—except certified and Grade A (tuberculin tested)—should in future be pasteurised. As a condition of registration in the business it is intended that the authorities should require the installation of a satisfactory pasteurising and cooling plant, and should undertake the necessary examination and inspection. In order to obviate hardship it is suggested that a year should elapse between the passage of the act and its enforcement. The *Manchester Guardian* states that already about three-quarters of the city's milk-supply is pasteurised.

THE JAMES MACKENZIE INSTITUTE FOR CLINICAL RESEARCH.

THE annual report of this institution shows that the work initiated there is being steadily carried on. During the year 97 new cases and 1150 additional notes were added to the files, while 795 specimens were examined in the laboratories. A complete survey of the records having now been made, certain groups of cases are to be investigated in furtherance of the principles of Sir James Mackenzie's viscero-motor and viscero-sensory reflex theory. Individual members of the staff have studied the ætiology of the common cold and its relationship to carbohydrate intake, the effect of fatique on the position of viscera, the cause of bacilluria, and have surveyed the physica state of children under 5. The scheme of continuou observation of children up to school age is a usefu means of investigating the primary causes of ill health and of ensuring early treatment.

Births, Marriages, and Deaths

BIRTHS.

ANDERSON.—On Dec. 27th, 1931, at Hong-Kong, the wife James W. Anderson, M.B., Ch.B., F.R.C.S. Ed., of daughter.

CHITNIS.—On Dec. 20th, 1931, in a Birmingham nursing hom the wife of C. N. Chitnis, M.R.C.S., L.R.C.P., of a son.

COLLEY.—On Dec. 13th, 1931, the wife of R. Colley, M. Ch.B., D.O.M.S., of The Circus, Bath, of a son.

RICE.—On Dec. 26th, 1931, at Thorpe-road, Norwich, the wi of Dr. R. A. C. Rice, of a son.

MARRIAGES.

CRUICKSHANK—LOCKHART.—On Dec. 24th, 1931, at the Par Church, Great Shelford, near Cambridge, Douglas Barr Cruickshank, L.R.C.P. Edin., L.D.S., D.P.H. Cam to Hilda Joyce, third daughter of Mr. and Mrs. E. Lockhart, of Riversdale, Great Shelford.

DEATHS.

ALCOCK.—On Dec. 27th, 1931, George Herbert Alcock, M.R.C. L.R.C.P.

BIRD.—On Jan. 3rd, at 27, St. Peter's-road, St. Margaret's-o Thames, Tom Bird, M.A. Oxon., M.R.C.S., Anæsthetist Guy's Hospital 1881 to 1903, Consulting Anæsthetist sin 1903, aged 88 years.

BROWN.—On Jan. 3rd, suddenly, Joseph Norwood Brow M.D. Lond., of Finchley-road, N.W.

BROWN.—On Dec. 21st, 1931, at Mayfield, Hatch End, Andre Brown, M.D., M.R.C.P., in his 91st year.

CAREY.—On Dec. 31st, 1931, at Sausmarez House, Guernse Lieut.-Colonel John Thomas Carey, late R.A.M.C., ag 80 years.

HOLBECHE.—On Dec. 25th, 1931, at his residence, Priors Cr Malvern, Arthur Oliver Holbeche, M.R.C.S., &c., in 77th year.

HOLTON.—On Dec. 24th, 1931, suddenly, Francis William Par Holton, M.R.C.S., L.S.A., aged 74.

PITT.—On Jan. 1st, at Brandhoek, Gerrards Cross, Edwa Pitt, L.D.S., R.C.S. Eng.

THOMAS.—On Dec. 27th, 1931, at Welwyn, Herts, Dr. Benjam Wilfred Thomas, third son of the late Dr. Benjamin Thom of Llanelly.

WALKER.—On Dec. 27th, 1931, at Peterborough, Russ Ernest Walker, M.B., F.R.C.S.E.

WINTER.—On Dec. 24th, 1931, at The House that Jack Bui Wolverhampton, Walter Henry Trimnell Winter, M.R.C. L.R.C.P.I., son of the late G. W. Winter, of Ceylon.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices Births, Marriages and Deaths.

ADDRESSES AND ORIGINAL ARTICLES

SOME EFFECTS OF TRAUMA ON THE NERVOUS SYSTEM.*

BY C. M. HINDS-HOWELL, D.M. OXF., F.R.C.P. LOND.,
PHYSICIAN TO ST. BARTHOLOMEW'S HOSPITAL AND THE NATIONAL HOSPITAL, QUEEN-SQUARE.

INJURIES of the head take a prominent place among traumatic causes of nervous disorders, and it is worth while to study them in some detail. A severe blow on the head, whatever its origin, may produce the symptoms of concussion or of cerebral compression. It may cause no anatomical damage on the one hand, or on the other it may give rise to fracture of the skull, hæmorrhage, or contusion of the brain. Depressed fractures or perforating wounds may in addition cause laceration of the cerebral tissues.

Simple concussion results in loss of consciousness of a quite transient character. In any case where loss of consciousness is prolonged it is safe to assume that something more than simple concussion has occurred, and that there has at least been some contusion of the brain, with or without serious hæmorrhage. It is very important to recognise the site of this hæmorrhage. It may be extradural, e.g., when the middle meningeal artery is ruptured, subdural, or subarachnoid.

In *extradural hæmorrhage* with concussion the patient regains consciousness and there is then a period in which symptoms may be slight or non-existent. Where symptoms of concussion are absent there may at first be nothing to indicate anything serious; then after a longer or shorter period, known as the lucid interval, evidence of pressure appears, which may be manifest in focal symptoms alone, or progress with continuing hæmorrhage to the full picture of cerebral compression. Such symptoms are quite familiar: unconsciousness deepening into coma, bounding pulse, rising blood pressure, pupils usually dilated, and stertorous respiration. Death follows inevitably from respiratory failure unless relief from the compression is obtained.

The following case illustrates the effect of a small extradural hæmorrhage:—

A young man, aged 20, was playing cricket and while batting was hit on the left temple. He was not so seriously damaged at the time as to stop his innings, for he was able to resume it after a few minutes. The same evening he developed a severe headache and vomited. Two days later he had a typical Jacksonian fit limited to the right face. During the attack he was unable to speak. He consulted me about this and while in my room had a similar attack which lasted about five minutes. One could feel nothing on palpating the injured area, but at operation a fracture of the saucer variety was found and an extradural blood clot. The dura was opened but there was no subdural hæmorrhage and no evidence of contusion. I thought the patient, who made a good recovery after operation, was cured, but six months later he had two generalised epileptic fits. He was put on a course of bromide and remained free from further fits. I am sure the mistake I made in this case was the omission to put the patient on bromide directly after his operation, and in any similar condition I am sure that this would be a wise precaution.

In extradural hæmorrhage the lucid interval to which I have referred, when present, is very characteristic, and signs of a focal lesion in the brain are often present. It must be noted, however, that the lucid interval may be absent or of exceedingly short duration.

Jonathan Hutchinson described dilatation of the pupil as occurring on the homolateral side in the majority of cases of extradural hæmorrhage. That it may be seen at times is certain, but Bathe Rawling, in his book, the "Surgery of the Skull and Brain," states that in his cases the pupils were equally dilated in 46 per cent., constricted on the homolateral side in 36 per cent., and only dilated on the homolateral side in 18 per cent. Von Bergman's figures, quoted by Rawling, showed 30 per cent., with a Hutchinson pupil in 70 cases. In 56 per cent. both pupils were equally dilated.

Subdural and Subarachnoid Hæmorrhages.

When there is subdural or subarachnoid hæmorrhage the injury to the skull has nearly always been severe and there is often a fracture. The venous sinuses may be torn through, and hæmorrhage from superficial cerebral vessels may occur. The brain is often contused or lacerated as well. Under these circumstances the clinical picture is likely to differ materially from that of uncomplicated cases of extradural hæmorrhage.

As the blood usually diffuses freely through the subdural space focal symptoms are rare as compared with cases of extradural hæmorrhage, and symptoms of cerebral irritation and compression are early. The lucid interval which we have seen may be a characteristic of extradural hæmorrhage, is often absent or very short.

A very interesting condition is localised subdural hæmatoma. The cases in which this occurs are often those in which the head injury has appeared to be comparatively trivial. After the initial shock the patient seems to recover, but usually not completely. One is often told by relatives that the patient "never seemed to get quite right." But after a period varying from a few days to several weeks symptoms of a focal lesion begin to make their appearance, in addition to those of headache, irritability, giddiness, which may be already present. Gradually the symptoms of increasing cerebral compression develop, and unless they are relieved by operation the patient becomes comatose and dies.

The following case,[1] which was under my care and which was operated on by Mr. Paterson Ross at St. Bartholomew's, well illustrates several important points in connexion with this type of case.

A man, aged 64, was on August 23rd, 1927, knocked down by a bicycle. He was concussed and taken to the Royal Northern Hospital. He was detained but as he appeared quite well and no fracture of the skull was discovered, he was discharged a few days later. In mid-September he became lethargic and had difficulty in walking and by the end of September was unable to walk. On Oct. 10th he had an attack of vomiting with severe headache and thereafter became unable to feed himself. I saw him on this date and got him admitted under my care at St. Bartholomew's Hospital at once. His condition there varied from a semi-comatose state to complete consciousness and his physical signs varied as well. He had, however, a constant degree of right-sided hemiplegia with extensor plantar reflex on the right, flexor on the left. The leg was more affected than the arm.

On account of the long latent period a diagnosis of localised subdural hæmatoma was clearly established. Mr. Ross operated on the left side and found beneath a discoloured dura the typical blood clot, enclosed in its characteristic membrane, extending over almost the whole hemisphere. This he evacuated, finding the cortex depressed beneath it. Next day the patient was much more conscious and could move his right leg better than before operation. He relapsed, however, and again became unconscious 24 hours after the operation. In the belief that a further hæmorrhage had occurred the wound was reopened. No hæmorrhage was found, but it was noted that the depressed brain had not expanded. After this he gradually sank and died on the third day after operation. At the post-mortem a second and even larger hæmatoma was found on the opposite side of the brain. It was very remarkable that this second hæmatoma had seemingly caused no physical signs.

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* A paper read before the Colchester Medical Society.

[1] Reported by J. P. Ross, St. Bart.'s Hosp. Rep., 1928, lxi., 112.

At that time I was unaware that the condition is frequently bilateral, but I now know that this is more often so than not. A small trephine opening should always be made on the opposite side, when the appearance of the dura will enable the presence or absence of a hæmatoma to be determined.

Injury of the brain tissue may take place without serious hæmorrhage, and usually on the side opposite to the site of injury. Coutrecoup is no doubt the explanation of this. Concussion followed by cerebral irritation and perhaps by symptoms of compression due to cerebral œdema is likely to occur. Paralysis may of course be present, depending on the site of the injury. *If so, it will come on immediately after* the injury, a fact which will serve to distinguish a primary brain lesion from an extra- or subdural hæmorrhage.

These cases of head injury present many difficult problems. The clear-cut difference between extra- and subdural hæmorrhage is commonly obscured owing to the presence of both, and the development of cerebral œdema may complicate the diagnosis where no hæmorrhage has taken place. Lumbar puncture should always be performed, for it may give important information in connexion with diagnosis, and is also a helpful therapeutic measure. Wherever there has been a considerable subarachnoid hæmorrhage the cerebro-spinal fluid will contain a large quantity of blood.

The pressure of the cerebro-spinal fluid should also be measured, for with increasing intracranial pressure the pressure of the cerebro-spinal fluid rises. The great danger in severe cases of head injury is from this increasing cerebral compression, due as often *to contusion and œdema of the brain as to hæmorrhage.* When the indications of a focal hæmorrhage are clear, and where it is impossible to combat the increasing compression by other measures, an operation should be undertaken. But I want particularly to emphasise the fact that cases in which there is a localised hæmorrhage which can be successfully treated by operation are few and far between. They are immensely outnumbered by those cases in which surgery, if attempted, is more likely to lead to disaster than to improvement. Careful nursing and the judicious use of such measures as lumbar puncture and the intravenous injections of hypertonic saline (30 c.cm. of a 30 per cent. solution) will usually prove more helpful than surgical intervention.

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The appearances at operation are very characteristic, as the dura is found to be tense and the subarachnoid space distended with fluid compressing the cord. As soon as the arachnoid is punctured the fluid escapes with a gush and thereafter the symptoms of compression of the cord are relieved.

A case of the kind which I had under my care was that of a boy aged about 20 who fell backwards over the back of operation. In the belief that a further hæmorrhage had occurred the wound was reopened. No hæmorrhage was found, but it was noted that the depressed brain had not expanded. After this he gradually sank and died on the third day after operation. At the post-mortem a second and even larger hæmatoma was found on the opposite side of the brain. It was very remarkable that this second hæmatoma had seemingly caused no physical signs.

At that time I was unaware that the condition is frequently bilateral, but I now know that this is more often so than not. A small trephine opening should always be made on the opposite side, when the appearance of the dura will enable the presence or absence of a hæmatoma to be determined.

Injury of the brain tissue may take place without serious hæmorrhage, and usually on the side opposite to the site of injury. Coutrecoup is no doubt the explanation of this. Concussion followed by cerebral irritation and perhaps by symptoms of compression due to cerebral œdema is likely to occur. Paralysis may of course be present, depending on the site of the injury. If so, it will come on immediately after the injury, a fact which will serve to distinguish a primary brain lesion from an extra- or subdural hæmorrhage.

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A case of the kind which I had under my care was that of a boy aged about 20 who fell backwards over the back of a seat. He ricked his back at the time but was not laid up with it though he complained of severe pain for some days. About nine months afterwards he began to experience progressive disability in his legs, and ultimately developed a definite paraplegia with a sensory level, but without complete loss of sensation below this level. At operation a condition of affairs similar to that to which I have referred was found, and the boy ultimately made a good recovery.

INJURIES OF PLEXUSES.

The brachial plexus from its position is peculiarly liable to injury and it is exposed to risk very early in life. The danger to it is well known in cases of transverse presentation with a prolapsed arm. In such cases the upper roots of the plexus (C. 5, 6, and 7) are those chiefly exposed to injury and the lower roots from their more protected position are less likely to suffer.

A grave danger in cases of severe injury, for example from a fall, is that the roots may be torn out of the cord. This seems more likely to happen than rupture of the cords of the plexus itself. The first case which I saw of this impressed me very much.

A farmer weighing 16 st. was returning from market where he had certainly had some alcoholic refreshment. He was driving a dog-cart and fell out of this on to the road. The right side of his head and his right shoulder appear to have shared the force of his fall. His right arm was completely paralysed at first, flaccid, with absent reflexes and complete loss of sensation. Gradually the muscles supplied by the lower roots recovered, but there was absolutely no recovery in those supplied by the fifth, sixth, and seventh cervical roots. An exploratory operation was performed, and it was found that these roots had been torn out of the cord. An attempt was made to graft the damaged roots into the lower cords of the plexus, but without success.

Unless the cords of the plexus are ruptured or evulsed recovery follows in due course after injury, and this fortunately is the more common experience. As an example a man came under my care who had been injured in a rather unusual way.

He had taken two mastiffs for a walk, each on a separate lead. The mastiffs saw a cat and gave chase, taking their leader with them. They came on a lamp-post, one dog passing it on either side, and the unfortunate man, still holding on to his obstreperous charges, struck the lamp-post with the root of his neck. Paralysis of the upper brachial plexus type supervened, from which he recovered without operation.

The lumbo-sacral plexus is much less exposed to direct injury than the brachial plexus. There is an interesting though fortunately rare condition in which the lumbo-sacral cord sustains damage in the mother during childbirth. I have seen several such cases and wrote a short account of three in the *St. Bartholomew's Hospital Reports* for 1908. Within a few days following confinement the patient complains of severe pains in her leg, the particular leg affected depending probably on the position of the fœtus. The labour is likely to have been difficult and prolonged. There follows almost at once paralysis of the muscles supplied by the external popliteal nerve, whilst those supplied by the internal popliteal are affected to a much less extent. As a result there is foot-drop with loss of eversion of the foot, whilst plantar flexion is weak. The knee-jerk is brisker than on the sound side; the ankle and plantar reflexes are absent. Flexion of the knee may be weak, extension is well performed. Some sensory loss is present in the area of the fourth and fifth lumbar roots and the first sacral. In the cases I have observed improvement has taken place but recovery has never been complete. The delay between delivery and the development of symptoms (i.e., from two to nine days) suggests that some other factor besides trauma must play a part. This may be an inflammation, but in the cases I have observed there has been no rise of temperature and no evident sepsis.

General Nervous Disorders.

I will now pass on to consider trauma as it may affect certain general disorders of the nervous system.

There is, I am sure, no doubt that an injury may be the determining factor in the development of symptoms of latent organic disease. Thus the symptoms of syphilis of the nervous system may undoubtedly be unmasked by physical injury or shock.

Some years ago I was asked to give evidence in Court in a case which was brought by the driver of a horse 'bus against his employer. The man had been in regular work and apparently in good health until he was thrown from his box to the ground by his horse starting before he was securely seated. He was very much shaken by this and was taken home. He remained in bed for two or three days and when he got up was very unsteady on his legs. Examination showed a fully developed picture of tabes dorsalis. The case came into Court and I pointed out that the cause of tabes was something quite different from a fall off a 'bus. A very junior doctor who appeared for the plaintiff read a passage from Osler in which it was stated that trauma was an occasional cause of tabes. The 'bus driver won his case and certainly the joke was against me for the doctor for the plaintiff who had quoted Osler with so much success had just completed his time as my house physician.

Now although no amount of falls from 'buses will give anyone tabes dorsalis, it is certain that such an accident may precipitate the development of symptoms. In a similar way I have had more than one case in which the symptoms of general paralysis have developed following the shock of injury—not necessarily a head injury.

Another type of case in which injury may at any rate precipitate the development of symptoms is paralysis agitans.

A man, aged 52, a carpenter, was at work on a building and fell through a ceiling, sustaining a bad fracture of the humerus. It was set in a bad position in the first instance and had to be broken down and reset at St. Bartholomew's Hospital. As the time for this man's discharge approached I was asked to see him as he had developed a tremor. I found him with well-marked signs of paralysis agitans, already so severe as to prevent him resuming his employment. Before his accident he had no symptoms whatever of the disease. The conclusion is, I submit, irresistible, that the shock of his accident, mental and physical as it had been, was responsible for the development of his symptoms.

The evidence is not so clear in the case of such a disease as amyotrophic lateral sclerosis. This is fortunately not very common, but anyone who goes carefully into the history of these cases will find in a certain number of them a history of physical shock of some kind. We do not know anything very definite with regard to the ætiology of this disease, and Gowers's view of "abiotrophy"—an inherent lack of vitality in the motor cells of the cortex and spinal cord—has at least not been disproved. It is at any rate intelligible that a shock to the nervous system may prejudice the vitality of cells in which the vital spark is already burning low.

MEMORIAL TO A BELFAST PHYSICIAN.—Last week a memorial tablet to the late Dr. H. L. McKisack was unveiled at the entrance to one of the wards of the Royal Victoria Hospital, Belfast. The tablet bears the following inscription:—"To Henry Lawrence McKisack, M.D., F.R.C.P.—1859-1928—who gave his services to this Hospital from 1895 to 1924, and in his labours here, and beyond these walls, won the affection and gratitude of many." A sum of £618 has been subscribed to form the nucleus of a fund for original research in medicine and surgery.

OBSERVATIONS ON THE USE OF NEMBUTAL AND CHLORAL IN CHILDBIRTH.

By James Vincent O'Sullivan, M.D. N.U.I.,
M.R.C.P. Lond., F.R.C.S. Eng.,
OBSTETRIC REGISTRAR AND FIRST ASSISTANT, LONDON HOSPITAL;
AND
W. W. Craner, M.B. Lond.,
LATE RESIDENT ACCOUCHEUR AT THE HOSPITAL.

The use of sedative drugs to relieve the pains of labour has long been of universal interest. Many drugs and combinations of drugs have been tried but none has yet been widely accepted.

Chloral was introduced as a mild hypnotic by Oscar Liebreich in 1869. It has been used extensively for its sedative effects but given alone it does not produce a painless labour. The morphia and scopolamine combination was introduced by von Schneiderlin in 1899; it was used in midwifery by von Steinbuchel in 1902 in the first determined attempt to produce a painless labour and was popularised by the publication of a large series of cases by C. J. Gauss (1906). In the opinion of many, however, the disadvantages of this combination outweigh the advantages. The method introduced by J. T. Gwathmey has been successful in the hands of experts.[1] Avertin does not produce a painless labour, because its action seldom lasts more than one and a half hours (J. M. Connell [2]). Paraldehyde was tried recently by one of us (J. V. O'S.). It was given rectally in doses of up to one drachm to the stone weight of the patient. The best time to administer the drug was when the os uteri was between two-fifths to three-fifths dilated in primiparæ and when labour had started in multiparæ. The drug was always freshly prepared before use, but even so was too irritating to be given undiluted. At first the paraldehyde was diluted with ten times its own quantity of water, but in this case the bulk was too great to allow of a sufficient dose to be given. Next the drug was diluted 1 in 3 with olive oil. Though a few successes were obtained paraldehyde by rectal administration was given up in favour of nembutal and chloral, because in the majority of cases the drug acted as an enema and this tendency could not be satisfactorily overcome. Recently barbiturates have been used by various workers as analgesics in midwifery, but the results to date are conflicting. Nembutal [3] has been given by the mouth, but we can find no report of its routine administration in childbirth.

We have experimented with a combination of nembutal and chloral given by the mouth. This innovation was undertaken because, in the opinion of many, there was not a suitable combination of drugs which could be given with ease in general practice to women in labour. The combination of nembutal and chloral for oral administration has not, to our knowledge, been used before as a method of relieving the pains of labour. We present the records of 60 consecutive cases treated at the London Hospital in the wards of Mr. Eardley Holland and Mr. Victor Lack. It is our opinion that the results obtained show many advantages over the existing forms of analgesia in midwifery.

Nembutal is a recently introduced barbituric acid derivative (sodium-ethyl-methyl-butyl barbiturate) which hydrolyses on keeping, and is therefore put up in gelatin-coated capsules (grs. 1½ in each). It has the characteristic hypnotic properties of barbiturates though, as nembutal is rapidly excreted, the sleep is shorter than that produced by many others. Recovery from the drug takes place in about four hours. Nembutal is said to cause restlessness less often than other barbiturates.

Chloral hydrate is well known as a hypnotic. We gave it in grs. 30 doses in 3 oz. of freshly prepared home-made lemonade sweetened with three to four teaspoonfuls of sugar. This was necessary to overcome the bitter and unpalatable taste of the drug.

Method of Administration.

Selection of cases.—In our series of 60 consecutive cases we found no contra-indications. The combination of nembutal and chloral was given successfully in cases of test labour and in cases complicated by heart disease and albuminuria.

Environment.—Routine examination of the patient should precede the administration of the drug. The room should be dimly lighted and quiet. A nurse should be in constant attendance, although many of our patients were left unattended from periods varying from 15 to 30 minutes.

Time of administration.—The initial dose should be given to a primipara when the os uteri is two-fifths to three-fifths dilated and pains are occurring regularly; and to a multipara when the os is one-fifth to two-fifths dilated and regular pains are present. The drugs are to be given by the mouth only. A total dose of nembutal grs. 7½ and chloral hydrate grs. 120 should not be exceeded in 12 hours. This total is reached by repeated single doses as follows: an initial dose of nembutal grs. 3 and chloral hydrate grs. 30; subsequent doses of nembutal grs. 1½ and chloral hydrate grs. 30. These drugs are not given simultaneously. The nembutal should always precede the chloral by ten minutes, because a lesser interval may excite vomiting. The first "repeat" dose is given two hours after the initial dose. Subsequent doses are given every three hours. The interval between doses should never exceed four hours; for when this period is exceeded amnesia is never complete.

Heart cases.—In heart cases to prevent the possibility of restlessness we advise that morphia gr. 1/8 be given hypodermically with the initial dose. The dose of morphia should not be repeated.

DIFFICULTIES.

The initial difficulties we met with may be described under the headings of dosage, vomiting, restlessness, and precautions.

Dosage.—As we did not know the power of the drugs and feared the effects on the mother and fœtus, we began by administering small amounts (an initial dose of nembutal grs. 1½ and chloral grs. 15) and incomplete amnesia resulted. Subsequently we increased the initial dose to nembutal grs. 4½ and chloral grs. 30, but found that this diminished the force and frequency of the uterine contractions. By experiment we found that the best initial dose was nembutal grs. 3 and chloral grs. 30. Too early administration tends to slow down labour. Labour actually came to a complete standstill for 24 hours in a primipara to whom the drugs had been given as soon as pains had begun. Too late administration—e.g., an hour and a half before delivery—did not give the drugs time to act fully, and the four cases classified as failures come under this heading. The time interval between doses also had to be found. Our aim was to produce a continuous amnesia. With the doses given as above we found that if the interval exceeded four hours, interruption of amnesia resulted. The best interval for the first "repeat" dose was found by experiment to be two hours; for subsequent doses every three hours.

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[1] Amer. Jour. Obst. and Gyn., 1923, vi., 456; Surg., Gyn., and Obst., 1930, v., 190; Irish Jour. Med. Sci., April, 1931, p. 162.

[2] THE LANCET, 1930, ii., 184.

[3] Brit. Med. Jour., 1931, i., 358; THE LANCET, 1931, i., 74 and 586; Proc. Roy. Soc. Med. (Sect. Anæsth.), 1930, ix. 210.

Vomiting occurred in our early cases and immediately followed the ingestion of the drugs. There was no vomiting when nembutal was taken alone, and it was prevented, firstly, by giving the drugs separately (eventually we found that a ten-minute interval sufficed) and secondly, by giving the chloral in smaller bulk, making it more palatable and causing the patient to sip it slowly.

Restlessness was noted in varying degree in 12 of our 60 cases. In ten the restlessness was slight. In two it was severe. One of these was a case of heart disease, in the other labour was normal. No patient became maniacal. Restlessness developed, either shortly after the administration before the full effects of the drugs had been established, or during the stages of recovery from the effects of the drug, if the patient was still in strong labour. In the former group no prevention was necessary as the excitement was always slight. In the latter group, if early in the second stage, the drugs were repeated in the doses recommended, or, if the head was crowning, a few whiffs of chloroform from a Junker's inhaler were given. Morphia gr. 1/12 to 1/6 was given in ten cases. Three of these were cases of heart disease, and it was given to prevent possible restlessness. In four it was given late in labour with the initial dose of nembutal and chloral. The remaining three were cases of prolonged test labour. Of the ten labours five were painless. In no case did restlessness occur after labour was completed.

Precautions.—No precautions were taken in our cases to exclude external sensory impulses. As a general rule the ward was not darkened, nor were the patients isolated apart from a screen around the bed. This procedure was unavoidable because of restricted accommodation. The labour ward was, of course, kept as quiet as possible, but this was difficult, because on many occasions two or three patients were in labour at the same time.

Clinical Effects of the Drugs.

The first effect of the drugs was a sensation of drowsiness which was followed by sleep. All the patients slept for varying periods after taking the drugs. Some awakened with the pains whilst others were only roused, and a few did not even move with the pains. Some patients were roused easily and could be made to talk and answer simple questions rationally though slowly. These patients usually had "islands of memory." Other patients were roused with difficulty, would answer questions very slowly, and then drop back to sleep whilst being questioned. A third group (two cases) could not be roused to answer any questions. These last two groups had no islands of memory. Only four patients were noisy and then only with the pains. Most patients slept for times varying from one to eight hours after delivery and awakened fresh and well. Respiration did not change in rate or depth. There was only one case of slight cyanosis, the cause of which we could not discover.

Cardiovascular system.—The pulse-rate did not alter. The blood pressure showed only slight variations between 5 and 10 mm. except in one case where it fell 25 mm. In this case the fall took place 15 minutes after the administration of the drug. The patient showed no signs of collapse or distress, and in an hour the pressure had regained its normal height.

Urinary system.—We had no case of retention or any other urinary trouble. This contrasts favourably with the morphia and scopolamine narcosis in which there is a tendency to retention.

Alimentary system.—The patients had no trouble with their bowels, and did not vomit at any time after delivery, nor had they any digestive upsets during the puerperium.

Central nervous system.—The pupils usually remained moderately dilated and reacted to light and accommodation. The conjunctival reflex was absent in several of our patients, and in two the corneal reflex was also absent. In four cases the patient had coarse nystagmoid movements on lateral fixation the following day, but these passed off within 12 hours. One patient had double vision for five hours. There were no other ocular disturbances. The tendon reflexes varied. In most cases they were unaltered, in some cases they were slightly increased or diminished, and in two cases they were absent. All reflexes returned when the patient awakened after delivery. Muscle tone, as a rule, was not interfered with, but in two cases the limb muscles were flaccid.

EFFECTS ON LABOUR.

First stage.—In 60 per cent. of our cases there was no lengthening of this stage. In the remaining 40 per cent. it was slightly prolonged but never excessively. It is interesting to note that in three cases of primary uterine inertia the pains were definitely stimulated in force and frequency after the drugs were administered.

Second stage.—In 50 per cent. of our cases there was no apparent lengthening of this stage. Labour advanced normally and the patient was able to bear down with the pains. In the other 50 per cent. there was a slight lengthening, and the bearing-down efforts were impaired. The average time of the second stage in the primipara was 2 hours and 36 minutes, in the multipara 1 hour and 30 minutes. In 20 cases we gave chloroform only with the crowning of the head. Of these 20 cases 13 were painless labours. Chloroform can be given by Junker's inhaler (the method we used) by the drop method, or in ampoules. From an analysis of our cases we note that forceps delivery was used in ten (one multipara and nine primiparæ). In two of these cases the use of forceps was indicated because th[illegible] patients had rheumatic valvular disease of the heart, and in three others to terminate test labours, one of which we shall describe below (Case 3). In the remaining five cases forceps were applied for delay in the second stage, two of these being for unrotated posterior positions. A general anæsthetic of either gas-and-oxygen or ether was given in all ten cases. Pituitrin was given in two cases where the head was delayed at the vulva.

During the last two and a half years the forceps rate at the London Hospital was 13·4 per cent. In our 60 cases it was 16·6 per cent.

Third stage.—There was no prolongation, the average time being 17 minutes. In 54 cases the placenta was expelled spontaneously or expressed from the vagina without any excessive bleeding. Post-partum hæmorrhage occurred in six cases. Five of these were mild (average loss 15 to 20 oz.), one was severe (loss 30 to 40 oz.). Of the five mild cases three were immediate, two were delayed. In the two delayed cases the hæmorrhage occurred two to three hours after delivery. All the mild cases were controlled by fundal pressure and an injection of pituitrin and ergot. In the severe case there was a bicornuate uterus and a bipartite placenta which separated incompletely, one part remaining in the uterus and the other in the vagina.

EFFECTS ON THE FŒTUS AND PUERPERIUM.

We have given nembutal and chloral in 60 cases, many of them difficult labours, and in no case have we had a dead child. The babies in all but six cases were born healthy and of good colour, and cried lustily. Four of these six infants were born in apnœa and two in white asphyxia. The latter two were born in test labours. Two of the former had morphia. In all of these cases regular breathing was established within ten minutes.

The puerperium was normal in all but one case in which parametritis occurred. The milk flow was never disturbed and the babies throve during their stay in hospital.

Results.

The standard by which we determined our results was based on the statements made by the patients when questioned on the day after labour. These results were as follows:—

(*a*) Painless labour..	..	37	cases	....	62 per cent.
(*b*) Very good result	..	13	„	....	21 „
(*c*) Good result	.. ..	6	„	....	10 „
(*d*) Failure	.. ..	4	„	....	7 „
		—			—
Total	.. ..	60	„	....	100 „

(*a*) Complete amnesia. (*b*) Very good results when the patient had vague recollection of a few incidents, such as the birth of the head. Many of these labours would undoubtedly have been completely painless if chloroform had been given during the birth of the head. (*c*) Good results, in which partial amnesia was present and when the intensity of the pains was diminished. (*d*) Failures, when the patient slept in the intervals between pains but remembered all her labour.

The following are examples to illustrate our results:—

CASE 1. *Painless labour.*—Aged 31. Three previous labours. Treatment was started when the os uteri was one-fifth to two-fifths dilated and the uterus was contracting regularly. The duration of the labour from the time of the giving of the drug was 8¼ hours. Nembutal grs. 6 and chloral grs. 90 were given during this period. The first stage lasted 9½ hours and the second stage ¾ hour. The third state lasted 20 minutes. No post-partum hæmorrhage occurred. No restlessness. No choloroform was given. The baby was born healthy ahd cried at once. When asked the following day about her labour the patient could recollect nothing after taking the first dose of the drug.

CASE 2. *Painless labour.*—Aged 26. One previous labour. A case of twins. Treatment started when the os was two-fifths and regular pains were occurring. The initial doses of nembutal grs. 3 and chloral hydrate grs. 30 were given. Three "repeat" doses of nembutal grs. 1½ and chloral hydrate grs. 30 were administered. Patient slept between the pains. There was no restlessness. The first stage lasted 14 hours. The second stage lasted ¾ hour. Both babies were breech deliveries. Both babies were healthy and cried at once. There was no post-partum hæmorrhage. The total duration of labour from the time of the administration of the drugs was 10¼ hours. This patient awakened eight hours after her delivery, put her hand on her abdomen and said, "where are my babies?" She did not remember anything of her labour after the first dose.

CASE 3. *Painless labour.*—Aged 23. Primipara. Test labour at term. Small round pelvis. On Nov. 14th patient was examined under an anæsthetic and though there was slight overlap of the fœtal head it was thought that the head would mould through the pelvis. Surgical induction by pig's bladder at 8 P.M. was followed by some pains in a few hours. The next day the bladder was removed from the vagina and the os was found to be four-fifths. On Nov. 16th at 5 P.M. patient began to have definite pains. At 8 P.M. the pains were occurring 1 in every 5 minutes. Nembutal grs. 3 and chloral hydrate grs. 30 were given. At 10 P.M. morphia gr. 1/6 was injected to ensure deep sleep. On the 17th at 4 A.M. the os was full. Pains were moderate in force. The baby's head was still high but was slowly moulding through. The patient was sleeping soundly between pains. At 8.30 A.M. nembutal grs. 3 was given to the patient. At 1.30 nembutal grs. 1½ and chloral grs. 30 were given. At 2.30 P.M. patient was flaccid. There was no corneal reflex present. The uterus was contracting regularly. At 4 P.M. a mid forceps delivery was performed under gas and oxygen. The child was limp and feeble at first but recovered fully in 10 minutes. The third stage was completed in 15 minutes. There was no post-partum hæmorrhage. The total drugs given in this case were nembutal grs. 9, chloral hydrate grs. 90, and morphia gr. 1/6. Labour was completed 20 hours after the administration of the drug. The second stage lasted 12 hours. Next day the patient remembered nothing about her labour after the giving of the drugs. The patient had a normal puerperium and the baby was in excellent health on discharge from hospital three weeks after delivery.

CASE 4. *Very good result.*—Aged 29. Primipara. Labour lasted 17 hours. Total doses nembutal grs. 6 and chloral grs. 60. The first dose was given when the os uteri was three-fifths dilated. Patient slept soon after the administration of the drug. Patient remembered vaguely the pains towards the end of her labour but did not remember the birth of the head. She remembered a stitch being inserted into the perineum.

CASE 5. *Good result.*—Primipara. The drugs were given when the os uteri was three-fifths dilated. The total dose given was nembutal grs. 6 and chloral hydrate grs. 60 and chloroform during the birth of the head. There was no restlessness. The second stage lasted one hour and the third stage ten minutes. There was no post-partum hæmorrhage. When asked the following day patient said that she felt much better after the drug, but remembered the whole of the labour vaguely until the mask was put on her face when she remembered no more. Patient "would like to have the drug with the next baby." Baby cried lustily when born and was healthy on discharge from hospital.

CASE 6. *Failure.*—One child previously. The drugs were given late in labour when the os uteri was four-fifths dilated. The total drugs given were nembutal grs. 3, chloral hydrate grs. 30, and chloroform with the birth of the head. The baby was born 1½ hours after taking the drug. There was no post-partum hæmorrhage. The drugs "quickened the pains and made them stronger." Patient was given chloroform with the birth of the head and she did not remember this part of the labour.

Conclusions.

(1) In our opinion this combination of drugs is safe and can be given to any woman in labour. (2) The drugs are easily portable and are given without trouble to the attendant or discomfort to the patient. (3) Judging by our experience the drugs may be administered by midwives but they must follow the technique carefully and never vary it without the direct permission of a medical practitioner. (4) In our series of 60 consecutive cases we have had 62 per cent. of painless labours without any ill-effects to mothers or children.

We would like to thank Mr. Eardley Holland for reading this paper and giving us the benefit of his criticism.

THE TREATMENT OF ANÆMIAS.*

By Janet M. Vaughan, D.M. Oxf.,
BEIT MEMORIAL FELLOW.

Our knowledge of the ætiology and therefore of the treatment of anæmia has advanced rapidly during the last few years. We know something to-day both of the factors which are necessary for normal blood production and of those which can interfere with or inhibit it. Treatment therefore should have a rational basis if, in any given case, we can determine what essential principle is lacking or what interfering factor is present.

Normal hæmatopoiesis is dependent upon adequate supplies of: (1) iron, (2) copper, (3) at least two substances present in whole liver, (4) vitamin C, (5) some complex of vitamin B, and (6) secretion of the thyroid gland. A lack relative or absolute of one or more of these factors will produce anæmia. The deficiency, whether single or multiple, may be caused by *faulty intake due to unbalanced diet*, faulty digestion in the gastro-intestinal tract, faulty absorption from the intestines, faulty distribution through pathological blood-vessels, or excessive strain placed on the normal storage depôts by (*a*) sudden or chronic loss, such as hæmorrhage, or (*b*) increased demand, as in pregnancy (Ivy et al.).

IRON.

Iron is an essential constituent of the hæmoglobin molecule. Lack of iron, therefore, however brought about, will cause an anæmia which can be relieved by the suitable administration of iron. These iron-deficiency anæmias, which would in the past have been classified as secondary anæmias, are characterised by a low colour-index—since it is the hæmoglobin-building factor which is lacking—and red cells which are normal or smaller than normal in size. They are :—

Table I.—*Hæmoglobin regeneration after gastric hæmorrhage in patients who received massive iron therapy.*

Patient.	Lesion.	Hb. % gain.	Duration of treatment in days.
1*	Gastric ulcer.	58	37
2*	Gastro-enterostomy or bleeding duodenal ulcer.	38	40
3	Duodenal ulcer.	38	42
4	Gastric ulcer.	54	48
Average		47	42

* Transfusion.

1. Idiopathic microcytic or hypochromic anæmia, a group which includes the Plummer-Vinson syndrome—i.e., dysphagia associated with anæmia and splenic enlargement.
2. Anæmia following acute and chronic hæmorrhage.
3. The simple or nutritional anæmia of infancy.

Idiopathic microcytic anæmia has been extensively studied in this country by Witts. It occurs largely in young middle-aged women, a study of the age-incidence showing a steady increase to a maximum between 40–47. The history is usually vague. Breathlessness, weakness, indefinite gastric discomfort, possibly sore tongue and dysphagia are the usual complaints. Clinically the spleen is palpable in about one-third of the cases. The finger-nails may show a spoon-shaped deformity. Achlorhydria is common but not invariable. The van den Bergh reaction is negative. Such cases respond as dramatically to large doses of iron as pernicious anæmia does to liver.

The underlying cause of the deficiency of iron is not clear, though some of the factors already noted as being of importance may play their part. In some cases there is deficient absorption from the gastro-intestinal canal. Mettier and Minot (1931) have shown that iron is more readily absorbed from an acid than from an alkaline medium; Minot and Heath have more recently found that the reticulocyte response to iron is of less magnitude in cases with achlorhydria than in those with free acid, which suggests that faulty absorption dependent upon lack of acid secretion is of importance. Since typical cases occur with a normal acidity, achlorhydria cannot be sole cause any more than it is in pernicious anæmia. Davies suggests that the excess of mucous secretion found in these patients may exert an inhibitory effect on absorption.

Faulty distribution probably plays a part in some cases. The *frequent occurrence of chronic* scurvy and pellagra in patients with arterio-sclerosis led Mettier and Minot (1931) to suggest that faulty absorption through such abnormal vessels was a factor in the production of deficiency diseases. Such defective absorption by the vessels must lead to faulty distribution to the tissues. Certainly arterio-sclerosis, if present, limits the efficacy of treatment with both iron and liver, since it is necessary to give bigger doses of the missing factor to obtain the same result in arterio-sclerotic subjects.

Faulty diet leading to chronic iron starvation is also of importance. Inquiry into the dietary history almost always procures the same answer: meat and green vegetables, the chief iron-producing foods, have either from personal taste, fear of indigestion, poverty, or laziness been taken sparsely for a long period. However, as patients with pernicious anæmia must always take liver, so patients with idopathic microcytic anæmia in the majority of cases must continue to take iron indefinitely, suggesting that there is some fundamental defect in iron metabolism present, apart from the contributory causes discussed. (Davies; Witts.)

Table II.—*Hæmoglobin regeneration after gastric hæmorrhage in patients who did not receive massive iron therapy.*

Patient.	Lesion.	Hb. % gain.	Duration of treatment in days.
1	Duodenal ulcer.	18	49
2	" "	22	51
3	" "	22	52
4*	Gastric "	24	57
5	Duodenal "	0	73
6	Gastric "	56	100
7	" "	58	120
8	" "	44	129
Average		30	79

* Transfusion.

The influence of an iron-poor diet on hæmoglobin production is apparent after gastric *hæmorrhage*. A small group of patients having severe secondary anæmia after gastric hæmorrhage were given not less than grs. 60 of Blaud's pill, in powdered form, daily. The average gain of hæmoglobin was 47 per cent. in an average period of 42 days (Table I.). Two of these cases, as indicated, also received one or more blood transfusions as an emergency measure nmediately after hæmorrhage, but without pparently influencing the result. In one there had een no improvement in a previous period of 64 ays in spite of transfusions and small doses of iron nd arsenic. A control series of patients who did not eceive adequate iron therapy had an average gain f 30 per cent. hæmoglobin in 79 days (Table II.). similar difference was apparent in the length of ime required for the red cells to reach a figure of 4,000,000 per c.mm. In the group receiving iron uch a level was reached in 23 days as compared ith 45 days in the control group (Table III.). It appears, therefore, that though the end-results were approximately the same in the two groups, a satisfactory blood picture was recovered more rapidly when large doses of iron were administered (Table IV.).

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* A paper read to the London Association of The Medical Women's Federation, on Dec. 15th, 1931.

TABLE III.—*Time required for red cells to reach 4,000,000 per c.mm.*

Patient.	Treatment.	Time in days.	Red cell increase per c.mm.
1*	Massive iron.	18	2,200,000
2*	" "	38	600,000
3	" "	18	1,500,000
4	" "	16	1,700,000
Average		23	1,500,000
3	Other treatment.	14	1,260,000
4*	" "	35	2,400,000
5	" "	37	1,280,000
6	" "	45	2,100,000
1	" "	49	2,600,000
2	" "	50	1,300,000
8	" "	62	2,580,000
7	" "	64	2,100,000
Average		45	1,950,000

* Transfusion.

TABLE IV.—*Effect of massive iron and other treatment on the blood picture after gastric hæmorrhage.*

—	grs. 60 Blaud's pill per diem.	Other treatment.
No. of cases	4	8
Average per cent. Hb. gain ..	47	30
Average time in days ..	42	79
Average red blood cell gain	1,500,000	1,950,000
Average time in days ..	23	45

Presumably there is a deficiency of iron in the average diet given after gastric hæmorrhage and therefore delay in hæmoglobin regeneration.

Mackay has recently shown that the so-called *nutritional anæmia of infancy* is also due to deficient intake of iron and can be relieved by the administrations of iron alone. This form of anæmia is more common in artificially fed than in breast-fed infants presumably because there is less iron in cow's milk than in human milk. Infants are in part dependent upon the iron stored in the liver at birth, that taken in the milk is insufficient for growth and therefore, unless egg yolk, meat, and green vegetables are given it is important to add iron to the child's daily food. Apart from the effect on hæmoglobin production, she found that the morbidity-rate was halved in the group of infants who received iron as compared with the group who did not receive iron. She suggests, therefore, that grs. 1½ of iron ammonium citrate in chloroform water three times a day, reached by gradually increasing doses, or else a dried milk to which iron has been added, should be given as a prophylactic to artificially fed infants.

In all these iron-deficiency anæmias deficient intake of iron appears to play some part though especially in the idiopathic microcytic anæmia the body's power of absorption and distribution are also at fault. The essential in treating this group, apart from attention to general diet, is to maintain adequate iron intake. Blaud's pill administered in powdered form to ensure that the iron is readily available is the most satisfactory drug—ferrous salts being more readily utilised than the ferric salts (Witts). Ferric ammonium citrate is, however, also reliable; grs. 60 a day must be regarded as a minimum dose, while grs. 180 is well tolerated. Such large doses have been given to patients as soon as ten days after severe and repeated hæmorrhages with no complaint of discomfort and no return of bleeding. During the last few years, when these massive doses have been given, no evidence has been forthcoming to support the text-book dictum that iron produces constipation. Intravenous, intramuscular, and all proprietary preparations of iron are as useless as they are expensive.

COPPER.

The part played by copper in the treatment of hypochromic microcytic anæmias is still uncertain, but the possibility of its value should not be forgotten. A deficiency of copper will cause nutritional anæmia in the rat (Hart et al.). Mills claims that given in conjunction with iron it produces a more rapid response than iron alone. Young found that gr. ⅛ given daily in a pint of water relieved an anæmia that failed to respond to iron. Since only very small quantities are involved and many iron preparations contain such small amounts as an impurity it is difficult to assess the exact value of copper.

LIVER.

It is clear that liver contains two substances which effect hæmatopoiesis, since certain anæmias respond to the combination of whole liver and iron, which are uninfluenced by iron and liver extracts effective in pernicious anæmia. The anæmias responding to whole liver and iron are microcytic and have usually a low colour-index. They are anæmia associated with (1) chronic hæmorrhage (Murphy and Power), (2) starvation (Keefer and Yang), (3) deficient dietary in children (Batey), (4) past sepsis (Batey), and (5) carcinoma (Jackson and Minot).

Presumably in all these cases there is deficient intake of substances essential for normal blood production. The cachexia of new growth, for instance, is only too apt to become a vicious circle. The patient feels ill and therefore limits the diet, especially if the lesion is in the gastro-intestinal tract. Such limited diets do not contain the substances essential to blood production, and hæmatopoiesis is therefore inhibited leading to anæmia which results in further loss of appetite. Jackson and Minot believe that such cases are distinctly benefited by raw meat juice, especially liver juice, adequate iron, and vitamin-rich substances as butter and fruit. Davidson has found that iron alone will induce marked hæmoglobin regeneration in patients with malignant disease.

The anæmias which respond to liver extract, or its substitutes such as stomach preparations, can be grouped together as *megalocytic anæmias*. They have usually a high colour-index and there is an increase both in the size and the variability of the red blood-cells associated with a leucopœnia. Idiopathic or Addisonian pernicious anæmia, sprue, the pernicious anæmia of pregnancy, and pernicious anæmia associated with gastro-intestinal lesions fall into this group (Vaughan, 1931). Though differing perhaps in their clinical features the underlying disturbance of hæmatopoiesis is dependent upon a deficiency common to them all—i.e., in the gastric digestion of protein. Our knowledge of this primary defect in gastric digestion is due to Castle and his fellow workers. Their experiments show that gastric juice normally contains some substance essential for the proper digestion of protein leading to the production of a factor necessary for hæmatopoiesis. This failure of the gastric juice occurring in the pernicious anæmia syndrome is at present unexplained. There is clinical evidence that it may be complicated as in the case of iron deficiency by failure of absorption in the gastro-intestinal canal and of distribution through abnormal blood-vessels.

There are a few patients who do not respond to extremely large doses of potent material given by mouth, but who show a prompt response when quite small doses are given either intravenously or intramuscularly. Clearly there is some failure of absorption, since apparently refractile cases respond to small amounts of potent material if given by parenteral injection (Gänssten; Strauss et al.; Wilkinson). Intramuscular preparations are without danger. Intravenous preparations may produce a lowering of blood pressure, and should therefore only be used when the patient can be under constant supervision. The possible rôle of failure of distribution due to arterio-sclerosis is evidenced by the fact that a larger proportion of patients who require a high maintenance dose have abnormal vessels than those whose maintenance dose is low.

In treating the megalocytic anæmias the first essential is correct diagnosis, the second is a realisation of the importance of adequate dosage. An anæmia with a colour-index above 0·9 should at once be suspected of falling into this group. An increase in both the size and degree of variability of the red cells clinches the diagnosis. Achlorhydria is additional evidence, but since the essential deficiency is not of acid, the presence of acid must not negative the diagnosis of pernicious anæmia. Acid is often present in sprue. It may occur in the Addisonian or idiopathic form and in other megalocytic anæmias. The presence of cord signs and a positive indirect van den Bergh reaction may be of value but are not always present.

In treating such cases it is essential to keep the red cell count well above 4,000,000 (Beebe and Lewis). The majority of cases that are reported as having failed to respond to liver by mouth have never been given adequate dosage. The group already mentioned that are unable to absorb the effective principle are small. Patients with severe cord lesions invariably require a higher maintenance dose than those without such lesions, as shown by Beebe and Lewis. In a study of maintenance dose they found a number of cases which required the equivalent of three pounds of liver a day if the red cell count were not to fall below 4,000,000. They also isolated a small group of patients who, unless iron were given in addition to liver, failed to reach a maximum figure.

Thyroid deficiency may exert a varying effect upon hæmatopoiesis. In adolescents particularly, hypothyroidism is sometimes associated with a low colour-index anæmia which is relieved by thyroid administration. There are certain cases, however, in older people, which are often diagnosed as idiopathic pernicious anæmia, some of whom respond to thyroid treatment alone, while others require both thyroid and liver therapy for complete clinical and hæmatological recovery. The possibility therefore of a mild degree of myxœdema should not be overlooked in treating apparently refractile cases of either microcytic or megalocytic anæmia (Mackenzie; Means).

Hydrochloric acid in some cases relieves indigestion, especially if whole liver is being taken. There appear to be no contra-indications to its use.

The anæmia of scurvy has been shown by Mettier and co-workers (1930) to respond to vitamin C only. Liver and iron are useless. Wills has found that some factor associated with the vitamin B complex fed in the form of marmite is as effective as liver extracts in treating tropical megalocytic anæmia. Experimental work by Guha and Mapson also suggests that vitamin B is closely associated with hæmatopoiesis. How these substances exert their action is not clear, but their possible therapeutic value should not be forgotten in treating anæmias of obscure origin.

FACTORS INHIBITING HÆMATOPOIESIS.

The factors which exert an inhibitory effect upon hæmatopoiesis either directly or indirectly are: (*a*) sepsis; and (*b*) certain toxic substances as benzol, lead, and excessive exposure to radium and X rays.

In analysing the results of liver treatment it was found that less than 1 per cent. of cases of pernicious anæmia had died since the introduction of liver, and in all severe sepsis had been present (Vaughan, 1930). Further, cases with a mild degree of sepsis require larger doses of liver or its equivalent to reach a satisfactory red cell level than patients free of infection. A guarded prognosis should be given in febrile patients, while if a satisfactory response to adequate therapy is not achieved, possible sources of sepsis should be eradicated. *It is often necessary to increase the daily dose during intercurrent infections* as bronchitis or tonsillitis. Sepsis exerts the same inhibitory effect on the action of iron in microcytic anæmias (Minot). How this is brought about is not known. There is a close parallel in the effect on insulin.

In treating anæmias due to toxic influences as lead or X rays, it is first of all essential to remove the patient from all further exposure. If a severe aplastic anæmia is present transfusion may be necessary. Iron, whole liver, and a balanced diet should also be given.

Blood transfusion is our only remedy in a group of anæmias of whose cause we known nothing, and for which therefore we can offer no rational therapy, neither prevention nor cure—aplastic anæmia, erythroblastic anæmia, and anæmia associated with active sepsis, nephritis, and the Banti syndrome. Forkner and Scott maintain that large doses of arsenic invariably improve the red cell count in the anæmia of chronic myeloid leukæmia. The anæmia of acholuric jaundice is relieved by splenectomy.

It appears, therefore, that apart from the latter group anæmias must be regarded as deficiency diseases which vary both in their clinical and hæmatological manifestations according as to which of the factors essential for normal blood production are lacking. The deficiency may be brought about by faulty diet, faulty digestion, absorption, or distribution, or by increased demands. Our aim in treatment must be to supply the missing factors in such a way that they can be readily utilised. Success is largely dependent upon recognition of the extreme importance of adequate dosage.

(Bibliography at foot of opposite page.)

THREE CASES OF ADDISON'S DISEASE

TREATED WITH AN EXTRACT OF SUPRARENAL CORTEX.

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In March, 1930, Swingle and Pfiffner[1] described the preparation of an aqueous adrenalin-free extract of the suprarenal cortex which revives comatose adrenalectomised cats and maintains them in perfect health; cessation of treatment with the extract is followed by death of the animals within ten days. Since then, 20 cases of Addison's disease treated with this extract have been reported in America by Rowntree and his co-workers,[2] and one case in England by Levy Simpson.[3] An immediate beneficial effect followed in 18 of these cases; in the other three the treatment failed, but in two of these adequate supplies of the cortical extract were not available at the time. In three of the successful cases the patient did not receive a further course of the extract when a relapse occurred, and died after returning home. The remaining 15 have continued to improve but have all required further injections of the extract from time to time.

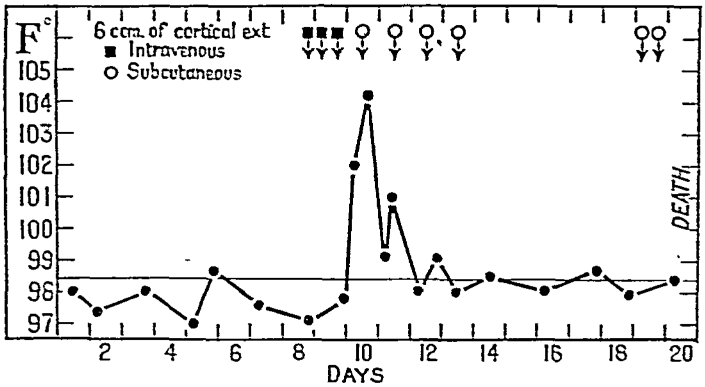
Recently a cortical extract has been prepared in England on a commercial scale by a procedure resembling that of Swingle and Pfiffner. The efficacy of this extract in the treatment of experimental animals has been demonstrated by Wilson.[4] Four cases treated with it with favourable results have been reported briefly by Levy Simpson.[5] In the cases described below, treated with the same preparation, the beneficial effects were to a great extent offset by certain toxic manifestations.

Case Reports.

Case 1.—A woman, aged 45, admitted to University College Hospital under the Medical Unit on April 15th, 1931, complaining of indigestion for three years, weakness and vomiting for six weeks, and pigmentation of the skin for three weeks. Tuberculous arthritis of the right hip in childhood. She was very weak, but not wasted. Generalised patchy pigmentation maximal on the face and hands and in the axillæ; slight pigmentation of the buccal aspects of the cheeks. Blood pressure (syst.) 110–118 mm. Hg. No other abnormal physical signs discovered. Urine, no abnormal constituents. Blood count normal. X rays showed no disease in the lungs and no calcification in the suprarenal areas.

During the next week her condition became much worse: she could not sleep and vomited persistently, being unable to retain even small quantities of water. Acetone bodies appeared in the urine. Blood-sugar curve inconclusive owing to vomiting of some of the glucose used in the test; no glycosuria. Blood-urea 90 mg. per 100 c.cm. On April 22nd she appeared almost moribund, was extremely dehydrated and too weak to turn in bed; B.P. 102 mm. 6 c.cm. of the cortical extract and two pints of glucose saline were given by the intravenous route and continuous glucose saline per rectum. On the 23rd she was still weak and depressed. B.P. 104 mm. Two injections of 6 c.cm. each of the cortical extract given and one pint of intravenous glucose saline with 20 units of insulin to combat ketonæmia. On the 24th the temperature, hitherto normal, rose to 102° F.; pulse-rate 128. Urine contained blood, albumin, acetone, and sugar; normal amount passed. In spite of this the patient felt and looked better, taking by mouth more fluid than she vomited. B.P. 104 mm. At noon 6 c.cm. of the cortical extract was given intravenously. At 2 P.M.—temp. 104°; pulse 130. No symptoms except headache: no rigors. At 10 P.M. she had pain under the right costal margin. No abnormal physical signs found. On April 25th she passed flatus with relief of abdominal pain. At 11 A.M.—temp. 101°; pulse 132; B.P. 94 mm. Headache and discomfort in lower abdomen. Urine contained less blood, albumin, and acetone; no sugar. 6 c.cm. of the cortical extract was given subcutaneously with no subsequent rise of temperature. On the 26th the condition was very much improved. Vomited only 2 oz. in the night. Ate jelly and toast and asked if she might get up the next day. No further vomiting. Urine contained less blood, a trace of albumin, no acetone or sugar. Temp. now normal. 6 c.cm. of the cortical extract given subcutaneously, and repeated on the following day.

Fig. 1 (Case 1).



Temperature chart.

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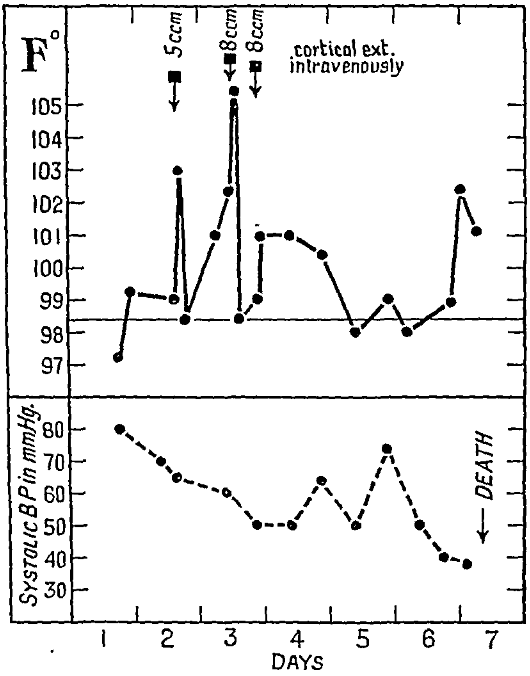
The administration of the extract was then stopped and improvement was maintained until April 30th, when intractable diarrhœa set in, following the administration of a mild purgative. Vomiting and weakness reappeared and blood, which had never totally disappeared from the urine, increased in amount. By May 4th she was again very weak and dehydrated; B.P. 78 mm. 6 c.cm. of cortical extract was given subcutaneously. At 6 P.M., another 6 c.cm. was given subcutaneously together with 1 pint of normal saline. Later she felt more comfortable and stopped vomiting. Early next morning, however, she suddenly became pulseless, with sighing respirations, and died in a few minutes.

Post mortem.—Heart: simple atrophy of myocardium. Lungs: normal; no evidence of tuberculosis. Liver: congested. Spleen: normal. Kidneys: rather congested, cortex soft and bulging; microscopically, a few fibrotic glomeruli seen, but no evidence of acute nephritis. Adrenals: twice the normal size and completely replaced by masses of firm yellow tuberculous caseation. Thyroid: normal. Pancreas: slightly atrophic; microscopically, the islets of Langerhans were normal in number; no hyaline or fibrous change. Right hip: healed scars of sinuses.

FIG. 2 (Case 3).



Temperature and blood pressure charts.

CASE 2.—A man, aged 24, first admitted under Sir Thomas Lewis on March 27th, 1931, with a history of loss of weight (20 lb.), and vague abdominal pains for two years, chronic cough for one year, and pigmentation, weakness, occasional diarrhœa, and vomiting for a few weeks. No previous illnesses. No history of tuberculosis in the family. He was somewhat apathetic and weak, and had a cough. There was moderate pigmentation of the face, hands, and of some acne scars on the back, but no buccal pigmentation. A few scattered rhonchi in the chest and slight tenderness in the left loin were the only other abnormal physical signs detected. B.P. 110/70 mm. Two sputum examinations revealed no tubercle bacilli. X rays showed slight infiltration of the apex of the left lung, but no calcification of the suprarenals. Blood count normal. Blood Wassermann negative.

As the patient's condition did not seem to require special treatment he was kept in bed and treated symptomatically. He improved rapidly and was discharged after five weeks to a convalescent home. Whilst in hospital the blood pressure readings were all above 110 mm. except for one of 96 mm. There was slight pyrexia, about 99, for the first few days; otherwise his temperature and pulse were within normal limits. On discharge his appetite was good but he had lost 4 lb. in weight.

He remained three weeks at the convalescent home, still feeling well. On returning home he rapidly became ill, with vomiting and weakness. After another week at home he was readmitted on June 16th, when his condition was found to be much worse and the pigmentation deeper. B.P. (syst.) 100–110 mm. After three weeks he was still very ill and it was decided to try treatment with the cortical extract; he was then extremely weak and apathetic, would take no solid food, and vomited once or twice a day; he slept badly and complained of abdominal pain. B.P. 76–84 mm. Blood-urea 84 mg. per 100 c.cm. Two intravenous injections of 6 c.cm. each of the cortical extract were given daily for a week, beginning on July 6th. By the third day of the course of injections he felt definitely better, his appetite began to return, vomiting had ceased, and he was sleeping well. By the end of the week he felt extremely well, had a huge appetite, was entirely free from pain, and wanted to get up. There was no appreciable rise of blood pressure and no change in the pigmentation. The injections produced no unpleasant reactions. During the week the temperature twice rose slightly (below 100°), but occasional slight pyrexia had occurred previous to the injections. Except for a trace of albumin on the sixth day the urine was normal. Blood-urea 32 mg. on discontinuing the injections. The improvement was maintained for ten weeks. He was up and about without fatigue and gained 1 st. in weight. The pigmentation was still unaltered, but the blood pressure rose during the six weeks following the course to a maximum of 108 mm. At the end of ten weeks the B.P. range was 96–100 mm., and he was then discharged feeling well.

On the same night a severe attack of asthma occurred which was relieved by adrenalin. During the next three weeks he was persistently asthmatic and vomited almost all his food. He was therefore readmitted on Oct. 20th, when the asthmatic attacks and vomiting promptly ceased. His appetite was good, but he was steadily losing weight. B.P. 90 mm. On Nov. 10th he started a week's course of four-hourly subcutaneous injections of adrenalin 1/1000. At the end of the week he felt stronger; he had gained 2½ lb. in weight, but there was no appreciable alteration in blood pressure. Improvement maintained until Nov. 25th, when vomiting returned and he had a typical attack of asthma, partially relieved by adrenalin. During that night and the next morning he had several attacks of asthma for which a total of 30 minims of adrenalin was given over a period of 13 hours; the last dose (10 minims) was given at midday. At 2.15 P.M. he felt better and drank a cup of milk. At 2.55 P.M. he died quite suddenly with no warning.

Post mortem.—Heart: small; some myocardial atrophy. Lungs: pleura adherent to chest wall; fibro-caseous masses at both apices; caseous patch in lower lobe of left lung; scanty recent miliary tubercles in upper lobes of both lungs; both lungs œdematous. Liver, kidneys, and spleen: normal. Adrenals: about one and a half times the normal size and almost completely replaced by tuberculous fibro-caseous masses; microscopically no normal adrenal tissue could be seen. Thymus: persistent, weight ½ oz.; microscopical structure typical. Pancreas: some fibrosis; islets normal.

CASE 3.—A woman, aged 43, admitted under Dr. H. Batty Shaw on Nov. 20th, 1931, with a four months' history of loss of appetite, loss of weight (21 lb.), occasional vomiting, increasing weakness, and gradual darkening of the skin. No previous history of illness. No family history of tuberculosis. Menopause at age of 35. She arrived in hospital very exhausted; temp. 97·2°; pulse soft, rate 72; B.P. 80 mm. Two days previously the B.P. was 92 mm. The whole integument was darkly pigmented, with patchy pigmentation inside the mouth. Some wasting, but not much dehydration present. Apart from the muffled character of the heart sounds physical examination revealed no abnormality in any of the systems; the urine was normal.

The next day she seemed the same, but the pulse was weaker and the B.P. 70/35 mm. Fluids were taken well by mouth. Urine excretion normal in amount. Radiograms of the chest and suprarenal areas were negative. By 3 P.M. the B.P. had fallen to 65 mm. (syst.); temp. 99°. At 3.15 P.M., 5 c.cm. of the cortical extract was injected intravenously. One hour later the patient felt cold and attacks of shivering began; temp. 103°, falling to 98·4° in two hours with cessation of shivering.

On Nov. 22nd the condition was unaltered. Temp. 102·4° at 10 A.M. B.P. 60/30 mm. At noon 8 c.cm. of the cortical extract was given intravenously. One hour afterwards attacks of shivering began; she became resentful of interference and almost unconscious at times. The temp. rose to 105·4°, falling sharply to normal within 1½ hours; the pulse-rate did not alter. That evening drowsiness and apathy continued, with occasional spasmodic twitchings of the limbs; no urine passed since 7 A.M.; pulse imperceptible; B.P. 50/30 mm. A third dose of the cortical extract (8 c.cm.) given intravenously, care being taken on this occasion to inject the warmed solution very slowly. Following this the temp. rose to 101°, but no other effects were observed. On the 23rd the patient could just be roused. Temp. 101°; radial pulse just palpable, heart-te 60/min., B.P. 50 mm. Blood-urea 118 mg./100 c.cm. lood-sugar curve normal. Taking fluids well by outh, no vomiting. Frequent spasmodic twitchings of e limbs present. Still passing no urine; only 240 c.cm. thdrawn by catheter at 1 P.M. (29 hours), containing a ght trace of albumin but no blood. Hot packs applied to e loins and diuretics administered. No more of the cortical tract given in view of the rigors. That evening she nproved slightly, the pulse was stronger, rate normal; P. (syst.) 64 mm.

On Nov. 24th, slight twitchings were still present. B.P. mm. Now passing small quantities of urine. Temp. ormal. Later that day there was a definite improvement; e twitchings entirely ceased, she was less drowsy, and oke sensibly to her relatives. Accompanying this change as a rise in blood pressure to 74 mm., an improvement in e pulse, and passage of urine in increased quantity. That ght continuous rectal saline administered, of which pints were retained. On the 25th B.P. fell to 50 mm. continent of urine and fæces: very weak. 6 P.M., patient uch worse; only just conscious at times, weakness treme. Pulse often quite imperceptible, heart-rate and unds unaltered. The temp. rose again to 102·4°; spirations rose to 44/min. and were sighing in character. P. 40 mm. (syst.) by palpation; no sounds audible over achial artery. No other abnormal physical signs found. drenalin and strychnine given with slight temporary provement. At midnight the pulse could just be felt; P. by palpation only 38 mm. Death occurred at 8 A.M. e next morning; no urine had been passed since 4 P.M. n the previous day, and none was present in the bladder st after death.

Post mortem.—Heart: small: some coronary atheroma. ungs: small healed scars at both apices; early patchy oncho-pneumonia. Liver: early nutmeg change; microopically fatty degeneration affecting the centre of the bules. Spleen: normal. Kidneys: rather pale: no ther abnormality either macroscopically or microscopically. drenals: pigmented and almost completely atrophied; icroscopically, a zone of normal medullary tissue surounded by a zone of vascular fibrous tissue containing ecrosed cortical cells, aggregations of lymphocytes, histioytes, and a few plasma cells. Thyroid: slightly atrophic. ancreas: normal.

Since the occurrence of these cases, our attention as been drawn to some untoward effects following ntravenous injection of the cortical extract in a ormal subject:

A. T. W., a subject in normal health, in an experiment n the action of the cortical extract on the basal metabolic ate in man, received a single dose of 10 c.cm. intravenously. Half an hour later malaise, headache, and muscular pains in he limbs occurred. One hour after the injection shivering ttacks commenced; the subject became collapsed, with lammy skin and feeble pulse of 100; B.P. 100 mm. One and half hours after the injection his condition had improved, ut shivering and pains particularly in the lumbar region were still present: temp. 103°; pulse soft, rate 107; respiraions 28; B.P. 130 mm. The next morning he felt better xcept for headache and universal tenderness of the skin; patchy erythema appeared all over the body and lasted 24 hours. Simultaneously herpes labialis appeared and lasted a little longer. Temp. 100·6°; B.P. 110 mm.; pulse 96. No other abnormal physical signs found. Two days later the temperature was normal and soon afterwards he returned to work. As a boy he was liable to have urticarial rashes.

Discussion.

The fatal termination of these cases of proved Addison's disease is disappointing when compared with the results of treatment obtained elsewhere, particularly as a beneficial effect followed administration of the cortical extract in Cases 1 and 2. The two factors militating against effective treatment were the disconcerting after-effects (seen in Cases 1 and 3) and lack of experience in the use of a new preparation. In Cases 1 and 2 definite improvement began after the third dose of cortical extract and was both subjective and objective. The patients rallied from their state of extreme asthenia, apathy, and depression, while vomiting ceased and appetite returned. In Case 1 the injections were combined with intravenous administration of glucose saline to combat dehydration; in Case 2 the extract was given alone. By the fifth day of the course of injections both patients wanted to get up and were eating and sleeping well. In Case 1 subcutaneous administration of the extract was substituted for intravenous after the rise of temperature and onset of hæmaturia following the third dose of extract. The relapse which occurred a few days later might, in our opinion, have been avoided had more of the extract been administered. The second case received a total of 78 c.cm. of the extract in 7 days. A few days later he was up and about the ward and began to put on weight. The average systolic blood pressure readings rose during the next six weeks by about 20 mm. of mercury. There was no appreciable alteration in the pigmentation. The improvement was maintained for ten weeks: vomiting then returned, together with attacks of asthma. On readmission to hospital, in view of the fact that vomiting had ceased, no further cortical extract was given, but the effect of a course of adrenalin was tried, which resulted in a gain in weight and strength. The occurrence of sudden death five weeks later indicates that the patient stood in need of the cortical hormone at the very beginning of the relapse. The temporary improvement following the course of adrenalin was comparable to that seen in cases treated by the Muirhead régime, which consists in administration of adrenalin to the limit of tolerance.

The severe rigors occurring in Case 3 within an hour of the injections appeared to accelerate the patient's downward progress; on the other hand, only 20 c.cm. of the extract were administered, an amount probably insufficient to produce the therapeutic effect. Suppression of urine occurred when the blood pressure was extremely low and a temporary rise of blood pressure was accompanied by passage of urine. In this connexion it may be noted that the critical level for urinary secretion is placed by physiologists between 40 mm. and 50 mm. of mercury; below 40 mm. cessation of urinary secretion invariably occurs (Starling). The infrequency of suppression of urine in Addison's disease may be accounted for by the rarity of very low levels of blood pressure. Smith[6] records a case which occurred at Guy's Hospital in 1897, before the days of the sphygmomanometer; Rowntree and Snell[7] refer to its occurrence a as terminal event. The occurrence of twitchings in Addison's disease is known but their cause is unexplained. The blood-urea in all three cases was raised; when the second case recovered from a crisis the blood-urea fell to 38 mg. per 100 c.cm. Rowntree and Snell[7] mention several cases with a raised blood-urea at a critical stage in the disease. A similar rise in blood-urea has been shown to occur with the onset of symptoms of adrenal insufficiency in adrenalectomised dogs (Rogoff and Stewart).[8]

THE TOXIC EFFECTS.

The toxic effects following the intravenous injection of the cortical extract consisted of rigors in Case 3 and in A. T. W.'s case, a high temperature and hæmaturia in Case 1, and slight albuminuria in Cases 1, 2, and 3. It is interesting to note that Cases 1 and 2 were due to tuberculosis, and Case 3 to atrophy, of the suprarenals. Similar effects do not appear to have been recorded by other workers, but in the first case of the recent series reported by Rowntree and his co-workers[2] there were some toxic symptoms which appeared one to two hours after intravenous injection of their cortical extract; these consisted of nervousness, nausea, and a feeling of coldness throughout the body. In this particular case no beneficial results following the administration of the cortical extract were observed, though a total of 500 c.cm. was given over a period of nine weeks.

In an attempt to elucidate the cause of these phenomena certain investigations of the commercial extract were carried out. Chemical tests by Dr. F. G. Young, at University College, London, failed to reveal the presence of adrenalin, though certain phenolic decomposition products of adrenalin were present; a minute amount of chlorbutol had been added as a preservative. A small trace of protein was definitely present, not amounting, however, to more than 10 mg. per 100 c.cm. of the solution. These results, with the exception of the finding of protein, agree almost identically with those obtained from tests conducted on their own extract by Swingle and Pfiffner. The samples of extract used in Case 3 and in the case of A. T. W. were tested for chance infection on account of the occurrence of the rigors and were found to be quite sterile. A. T. W. and one control were tested carefully for skin sensitivity to the batches of extract which had produced the rigors in his case and in Case 3. The results, which were negative, cannot be considered very conclusive since A. T. W. may have been in the negative phase of sensitivity following the intravenous injection; the difficulty of obtaining positive dermal reactions at any time is moreover well-recognised.

The tests, on the whole, suggest that the cause of the toxic effects was the trace of protein present in the extract. We are informed that a modification in the method of preparation of the extract is being investigated, which it is hoped will result in the elimination of all protein. If the preparation is given in its present form, great caution in regard to administration appears to be desirable; a preliminary dose of 0·5 to 1 c.cm. should suffice to demonstrate individual susceptibility; in the absence of any rise of temperature the ordinary doses of 5 to 10 c.cm. twice daily could then be given. The intravenous route has been found the best in the American cases, and was suitable in Case 2; subcutaneous injection was not followed by any local or general reaction in Case 1 though irritating local effects are mentioned by Rowntree and his co-workers; in animals the subcutaneous route is always used and found quite adequate. It would appear that as soon as the diagnosis of Addison's disease is made, the cortical extract should be given until the symptoms, with the exception of pigmentation, have disappeared. If there is a relapse a further course of injections should be started immediately symptoms reappear; delay until the patient is in a precarious condition renders treatment with extract more unsatisfactory.

Summary.

1. Three fatal cases of Addison's disease are described.

2. An aqueous, adrenalin-free extract of the suprarenal cortex was given intravenously in all three cases resulting in definite improvement in two which was not, however, sustained permanently after cessation of the treatment: the relapses did not receive prompt and adequate treatment with the cortical extract.

3. Certain toxic effects are described in two of the cases and also in a subject in normal health.

4. As a result of chemical investigations the trace of protein present in the extract is suggested as the probable cause of these untoward effects, which resembled on the whole those seen in protein shock.

5. Certain precautions are advised in regard to dosage and administration, if the preparation is given in its present form.

In conclusion, our thanks are due to the physicians of University College Hospital who kindly permitted us to publish details of their cases; to Dr. F. G. Young, of University College, for conducting tests on the extract; and to Dr. A. T. Wilson, of the Middlesex Hospital, for permission to describe his experiences.

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THE BLOOD-SUGAR CURVE IN MENTAL CASES.

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THE question of the abnormal blood-sugar curves often met with in certain types of mental patients has given rise to much discussion. One of the most recent comprehensive papers on the subject is that of McCowan and Quastel,[1] who clearly demonstrate the significance of the curve in manic-depressive insanity and define a hyperglycæmic index as a convenient measure for the degree of abnormality. The index is determined by the following formula:—

$$\frac{\text{2-hour blood-sugar level minus fasting level}}{\text{Highest blood-sugar level minus fasting level}} \times 100.$$

Before reviewing other published papers I will give the results of observations on 36 patients lately admitted to the Derby Mental Hospital. Originally 43 cases were examined, but since menstruation has been found to have a disturbing influence (McCowan and Quastel) the records of seven females menstruating at the time of the test have been omitted, all showing a hyperglycæmic index above normal. The mode of procedure in each case was as follows:—

A specimen of blood was taken in the early morning, the patient having fasted since the previous evening. Then 50 g. of glucose in 200 c.cm. of water was given by the mouth and the blood was examined at intervals of ½, 1, 2, and 3 hours. Folin and Wu's method of blood-sugar determination w[illegible] These results are recorded in the Ta[illegible], statement of the diagnosis, the bodily [illegible]al remarks.

Applying the hyperglycæmic index of McCowan and Quastel to the figures obtained in this investigation it will be seen on reference to the Table that an index over 50, which, according to these observers, should indicate a severe disturbance of carbohydrate metabolism, is given by 21 patients of whom nine had definite organic disease such as hyperthyroidism, diabetes mellitus, fatty degeneration of liver, cardi[illegible]vascular degeneration, or uræmia. *Of these patients, 14 were definitely undernourished, a few being even markedly emaciated; three of them had organic disease, and two were melancholics, whilst the remaining nine showed no evidence of somatic disorder.*

Apart from organic disease and emotional disturbance the state of nutrition of mental patients is of great importance in connexion with glucose tolerance. This is stressed because a large number of stuporose, confused, and depressed patients admitted to mental hospitals are found to be in a state of semi-starvation e to refusal of food or to obscure toxæmia. Bang[2] und that starving rabbits exhibited a greater and ore prolonged hyperglycæmia than well-nourished tes, and he concluded that in starvation the liver not prepared for glycogen formation. That this also the case in normal human beings is shown by angott,[3] who found a blood-sugar rise of 40 per cent. the fasting level in the normally nourished person ter the ingestion of 20 g. of glucose, whereas in the me person after three days' starvation an identical nount produced a rise of 243 per cent. The vestigations of Staub[4] made it clear that a reduced lycogen content of the liver caused maximal blood-gar figures after the administration of glucose, with rolonged hyperglycæmia, and he ascribes the efective glycogen formation to a transient hypofunction of the pancreas from starvation. Folin and Berglund,[5] on the other hand, from their work on glucose tolerance conclude that the glucose is disposed of by absorption by the tissues rather than by glycogen formation, and believe this to be the reason why prolonged hyperglycæmia does not occur in normal persons. The view that failure of or delayed glycogenesis in psychotics is associated with a disturbance of acid-base equilibrium has been brought forward by Mann and Scott.[6] Golla, Mann, and others[7] have recently found definite evidence that a large number of these patients show a disturbance of the $CO_2/NaHCO_3$ ratio of the blood, due probably to a failure of adjustment by the respiratory mechanism. The investigations of Eisner and Förster[8] revealed that hyperglycæmia after the

TABLE SHOWING RESULTS OF OBSERVATIONS ON THIRTY-SIX PATIENTS.

Patient.	Sex.	Age.	Blood-sugar in mg. %. Hours after glucose.					H.I.	Glycosuria.	Diagnosis.	State of nutrition.	Remarks.
			F.	½.	1.	2.	3.					
1	F.	36	81	121	164	150	158	83	Nil.	Benign stupor.	Poor.	Recovered.
2	F.	42	86	144	149	105	82	30	Nil.	Confusional insanity.	Good.	—
3	F.	21	98	142	148	90	78	0	Nil.	Puerperal toxic stupor.	Good.	Recovered.
4	F.	49	92	151	170	132	80	51	Nil.	Schizophrenia.	Fair.	—
5	F.	59	90	140	182	174	150	91	Nil.	Epilepsy.	Poor.	Resistive, tube-fed.
6	F.	54	86	153	142	108	80	32	Nil.	Alzheimer's Disease.	Good.	Cardiovasc. degen. Resistive.
7	F.	71	84	149	170	191	150	100	Nil.	Melancholia.	V. poor.	—
8	F.	30	91	138	145	158	80	100	Nil.	,,	Fair.	Recovered.
9	F.	52	90	140	165	140	78	66	Nil.	Confusional insanity.	V. poor.	Resistive, tube-fed. Recovered.
10	F.	36	90	161	182	82	91	0	Trace.	Schizophrenia.	Good.	—
11	F.	23	81	120	176	157	112	80	Nil.	,,	Fair.	Mild hyperthyroidism.
12	F.	28	110	160	155	90	100	0	Nil.	Imbecility.	Good.	—
13	F.	71	160	215	250	262	235	100	Pres.	Senile dementia.	Obese.	Diabetes mellitus.
14	F.	52	84	125	161	148	90	83	Nil.	Melancholia.	Fair.	Well-marked hyperthyroidism.
15	F.	25	92	131	151	80	90	0	Nil.	Moral delinquency.	Good.	—
16*	M.	20	138	220	360	570	380	100	Pres.	Toxic stupor.	Fair.	Died. Fatty degen. of liver, heart, kidneys.
17	M.	43	105	140	165	190	215	77	Pres.	General paralysis.	Emac.	Third stage of G.P.I.
18	F.	33	109	156	273	128	117	11	Pres.	Melancholia.	Poor.	Agitated and emotional.
19	F.	30	88	141	150	88	93	0	Nil.	Paraphrenia.	Good.	—
20	M.	22	82	129	129	126	60	93	Trace.	Schizophrenia.	Poor.	Refused food periodically.
21	F.	56	98	138	202	170	82	69	Pres.	Confusional insanity.	Poor.	Mitral stenosis. Albuminuria. Recovered.
22	M.	23	104	142	138	98	100	0	Nil.	Epilepsy.	Good.	—
23	F.	33	101	161	170	140	98	56	Nil.	Confusional insanity.	Emac.	Well-marked hyperthyroidism. Improved.
24	F.	62	105	130	165	259	235	100	Pres.	Arterio-sclerotic insanity.	,,	Marked cardiovasc. degen.
25	M.	22	96	132	146	92	101	0	Nil.	Imbecility.	Good.	—
26	F.	37	100	127	140	188	153	100	Nil.	Benign stupor.	Emac.	Resistive, refused food periodically.
27	M.	39	102	178	138	98	101	0	Nil.	Mania.	Good.	—
28	F.	45	94	232	241	169	121	51	Pres.	Confusional insanity.	Fair.	Alcoholism, jaundice, uræmia. Died.
29	F.	22	92	131	146	138	106	85	Nil.	Puerperal toxic stupor.	Poor.	Resistive. Slight albuminuria.
30	M.	35	95	165	142	90	91	0	Nil.	Schizophrenia.	Fair.	Congenital heart disease.
31	M.	25	94	158	173	72	94	0	Nil.	,,	Good.	—
32	F.	27	91	140	155	87	90	0	Nil.	Psycho-neurosis.	Good.	—
33	M.	59	104	186	286	197	132	51	Pres.	Melancholia.	Fair.	Agitated during test.
34	F.	53	98	146	169	205	115	100	Trace.	Benign stupor.	V. poor.	Resistive. Tube-fed several times.
35	F.	50	91	115	161	131	110	57	Nil.	Paraphrenia.	Poor.	Very confused and restless.
36	M.	40	98	155	172	98	78	0	Nil.	Melancholia.	Fair.	Very deluded, but not agitated.

H.I. = Hyperglycæmic index of McCowan and Quastel. F. = Fasting. V. = Very. Emac. = Emaciated.
* Curve after administration of 100 g. glucose.

administration of carbohydrates does not necessarily depend on the difference in the rate of glucose absorption and glycogen formation. These workers found a rise of blood-sugar from 85 to 110 mg. per cent. during the ingestion of white bread, and after ten minutes the value was 153 mg. Their conclusion is that the presence of carbohydrates in the stomach has a specific dynamic action on the hepatic glycogen.

Although the series of cases herein recorded is not a large one it seems reasonable to assume that in the nine emaciated patients without organic disease or emotional disturbance the low state of nutrition was the only factor which might explain the high hyperglycæmic index. This abnormal physical state can no doubt cause: (*a*) transient hypofunction of the pancreas with deficiency or absence of hepatic glycogen (Bang, Traugott, and Staub); (*b*) defective absorption of glucose by the tissues of the body (Folin and Berglund); (*c*) alteration in the pH of the blood, due to starvation acidosis and possibly to failure of adjustment of the respiratory mechanism (Golla, Mann, et al.); (*d*) abnormal lability of the hepatic glycogen so that glycogenolysis readily occurs—e.g., from introduction of carbohydrates into the stomach.

Apart from defective nutrition and organic disease one must, of course, take into account adrenalinæmia and the emotional syndrome, when dealing with blood-sugar curves in mental cases. It is an established fact that adrenalinæmia is antagonistic to glycogen formation, as is shown by the following examples:

Blood-sugar Curve after Ingestion of 50 g. Glucose.

Patient No.	Fasting.	½ hour.	1 hour.	2 hours.	3 hours.
	mg. per cent.				
2	90	140	152	108	88
35	91	115	161	131	110
Curve after Administration of Adrenalin ♏ x Intramuscularly.					
2	98	182	159	103	90
35	90	188	170	141	88
Curve after Simultaneous Ingestion of 50 g. Glucose and Administration of Adrenalin ♏ x Intramuscularly.					
2	88	250	380	330	118
35	91	240	353	265	126

It will be seen that there is almost an arithmetical summation of the effects of adrenalin and glucose in these patients. A similar mechanism, though of less intensity, is at work in the production of abnormally high and prolonged hyperglycæmia following glucose ingestion during states of emotional tension.

SUMMARY.

The interpretation of glucose-tolerance tests in mental patients is one of great complexity and in each case several factors may require to be taken into consideration. From the results above recorded it appears that undernutrition per se plays a very important part in the production of a high hyperglycæmic index and due allowance must be made for this state. Furthermore, it is well recognised that the presence of certain organic diseases, especially endocrine affections (diabetes mellitus, hyperthyroidism, &c.), hepatic and renal insufficiency, and marked cardiovascular degeneration, have to be considered, as well as the physiological disturbance of menstruation and the emotional state at the time of the test.

I am indebted to Dr. J. Bain, medical superintendent of the Derby Mental Hospital, for permission to publish the results of these investigations and to Mr. V. P. Corke for valuable help in carrying out the biochemical tests.

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VALUE OF THE
KLINE TEST FOR SYPHILIS.

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IN order to estimate the value of the Kline microscopic slide precipitation test for syphilis we took 2000 sera and tested them in parallel with the Wassermann[1] and Kline[2] precipitation reactions; in addition, a certain number of these sera were also submitted to the Kahn[3] and Sigma[4] reactions. In this investigation only the "diagnostic" Kline test with *heated* serum was employed, except in the first 500 cases when the "very sensitive" antigen was also used.

TABLE I.—*Comparison of Kline and Wassermann Reactions.*

Complete agreement	1538	96·5 %	Disagreement	71 .. 3·5 %
Relative agreement	391		Total	2000

—	Relative agreement.			Disagreement.		
	In favour of—		Undecided.	In favour of—		Undecided.
	Kline.	W.R.		Kline.	W.R.	
Early syphilis	13	0	—	5	0	—
Treated „	221	26	—	41	1	—
Not „	7	102	—	0	19*	—
—	241	128	22	46	20	5
	Total 391.			Total 71.		

* All negative W.R.'s and positive Klines.

A study of the Tables shows that the W.R. and Kline agree (more or less) in 96·5 per cent. of cases (1929), and disagree in 3·5 per cent. (71). In 46 of these 71 cases the Kline appeared to be the mor correct, and in 20 the W.R. (5 being undecided); whilst among the 391 relative agreements 241 favoured the Kline, against 128 in favour of the W.R. (the remainder being undecided). It will be readily seen therefore that the Kline test is decidedly more sensitive than the Wassermann; this was particularly evident in early and in treated cases of syphilis. On the other hand, the Kline test gave 1 per cent. of "false positives" against none with the W.R. Similarly the Kline proved rather more sensitive than the Kahn, but distinctly less specific, as evidenced three false positives in 480 cases; a comparison ith the Sigma test gave similar results.

The 2000 sera examined were taken at random ıd represented, for the most part, cases other than philis and cases of treated syphilis, together with a nall number of cases of early untreated syphilis. ı every case the diagnosis was very carefully estab-hed, so that an estimate of specificity as well as nsitivity could be made. In our hands the Kline st proved much more sensitive than the W.R., ıd rather more so than the Kahn or Sigma; in fact, appears to be the most sensitive of all the reactions ithin our experience, including the Meinicke, Müller, nd Hinton tests. It was more especially in early nd in treated cases of syphilis that the Kline showed s superiority. On the other hand, the incidence of false" positives (19 in 2000) was unduly high; re are quite unable to account for this, for the antigen mployed was that kindly provided by Dr. Kline imself.

ABLE II.—*Comparison of Kline and Kahn Reactions.*

omplete agreement .. 364 } 98·5% | Disagreement .. 7 .. 1·5%
elative agreement .. 109 } | Total .. 480

—	In favour of—		Undecided.	Total.
	Kline.	Kahn.		
elative agreement ..	53	38	18	109
isagreement ..	1	2	4	7
—	54	40	22	116

It appears, therefore, that the Kline test is of ıost value as an *eliminating* test for the exclusion f syphilis, and for test of cure rather than for iagnosis. Moreover, the test is so simply and quickly carried out (with practice 100 tests can be done in an hour) that it would be a practical proposition, where large numbers of sera have to be dealt with, to perform the Kline test on all and then retest all positives by the W.R. and/or one of the other flocculation tests.

On 500 sera the "very sensitive" Kline test was performed in addition, and it was found that this test was slightly more sensitive than the "diagnostic" and therefore preferable for eliminative purposes.

We have only a small experience of the Kline test on the cerebro-spinal fluid, but the fact that only fluids containing sugar (as proved by Benedict's test) are suitable for examination and the complicated and laborious nature of the reaction militate against it as a routine test.

TABLE III.—*Comparison of Kline and Sigma Reactions.*

Complete agreement .. 202 } 95% | Disagreement .. 15 .. 5%
Relative agreement .. 105 } | Total .. 322

—	In favour of—		Undecided.	Total.
	Kline.	Sigma.		
Relative agreement	57	32	16	105
Disagreement ..	12	3	0	15
—	69	35	16	120

We have to thank Colonel L. W. Harrison for permission to publish these results.

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CLINICAL AND LABORATORY NOTES

TETANUS FOLLOWING ULCERATION OF LEGS.

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A MAN, aged 61 years, of no occupation, was admitted to the Stepping Hill Hospital on August 1st, 1931, as a case of "ulcers of legs." He had extensive chronic ulceration of both legs, with parchment-like pigmented scarring surrounding the ulcers. The ulcers had been present for 12 years and were septic. He had dressed the ulcers himself with household rag and a proprietary antiseptic ointment. There had been difficulty in speaking and swallowing for four days before admission.

Examination showed tonic spasm of the jaws, but his mouth could be opened sufficiently for him to protrude his tongue. He could not swallow and articulation was difficult and indistinct. The pupils were round, regular, equal, and reacted to light and accommodation. The knee-jerks could not be elicited. The urine was normal. On August 2nd his condition was the same, except that the mouth could scarcely be opened. On the 3rd the neck muscles were rigid and there was some rigidity of the abdominal muscles. On the 4th there was definite opisthotonos, and in the early morning of the 5th he died. The case was apyrexial hroughout and he remained conscious until death.

The blood-urea was 47 mg. per 100 c.cm. The blood Wassermann was strongly positive 1/45 dilution.

Treatment was instituted on August 2nd by the administration of tetanus antitoxin intrathecally and intravenously in doses of 10,000 units under a general anæsthetic. Glucose salines were given per rectum and chloral and bromide added to the salines. Post-mortem examination on August 6th was negative except for fatty degeneration of the liver, possibly due to the long-continued septic condition of the legs. Pus from the surface of the ulcers on both legs was sent for pathological examination and the report was as follows:—

Bacteriological examination.—A stained film of the pus from the ulcer showed a few bacilli with round terminal spores, numerous streptococci and staphylococci. Tubes o cooked meat medium were inoculated with the pus and incubated anaerobically; in 48 hours the medium was turbid, with gas present, and some blackening of the meat had occurred; a film showed numerous round terminal-spored bacilli and streptococci. The culture was heated to 75° C. for 30 minutes to destroy non-sporing bacilli and a loopful inoculated into the condensation water of an agar slope as recommended by P. Fildes.[1] After 24 hours anaerobic incubation there was a fine growth over the whole surface of the slope and a feathery edge at the top. From this edge a subculture was made to another agar slope in order to be sure that the culture was pure, although a film showed only bacilli resembling *B. tetani*.

A suspension of the growth from the top of the second slope was made with saline, and 0·5 c.cm. was inoculated subcutaneously into the hind limb of a guinea-pig, a similar dose being given to a second animal which was protected one hour previously with 2000 units of tetanus antitoxin. In 18 hours the inoculated limb of the unprotected subject was extended, the muscles being in a tonic unrelaxing spasm; later in the day the other leg became involved but the spasm was not continuous. In 36 hours both legs were fully extended, the animal lay on its side, and when the cage door was opened a general spasm occurred, the head being drawn back; these general spasms became frequent and the animal died in 48 hours.

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[1] Brit. Jour. Exper. Path., 1925, vi., 62.

Post mortem there was hæmorrhagic œdema at the site of inoculation extending up to the lower abdominal wall. Loopfuls of this fluid were inoculated into cooked meat and agar slopes and after 48 hours' incubation characteristic bacilli were seen in films from both the cultures. A culture of the blood was sterile.

The protected guinea-pig remained well for three weeks, when it was killed. Apart from some swelling of the limb where the culture was inoculated there was nothing abnormal post mortem.

Tetanus is a rare complication of chronic ulceration of the legs. In this case there was no traumatic history, nor evidence of wound contamination with soil. An identical case has been recorded by Dr. W. S. Brindle.[2]

We have to thank Dr. Lois Stent, of the Public Health Laboratory, Manchester, for the bacteriological investigation and report.

RUPTURED TUBAL GESTATION.

BRUISING IN THE UMBILICUS AND ON THE ABDOMINAL WALL.

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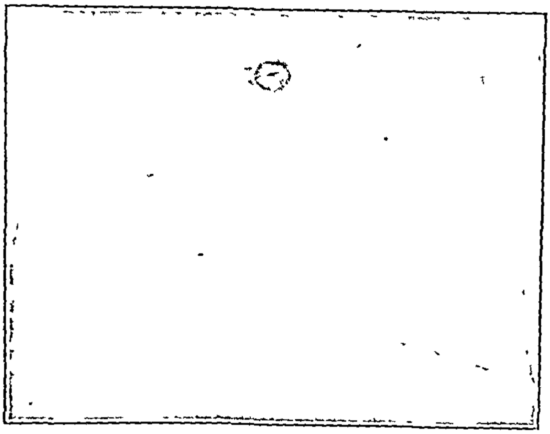
A WOMAN, aged 30, married five years but without children, was seen on Oct. 31st, 1931. She said she had had no previous illnesses and until the present illness the menstrual history was normal. The last period was on Sept. 24th. On Oct. 17th, as she was cooking the dinner, she suddenly felt severe pain in the vulva and a desire to pass water. The pain spread to the abdomen below the umbilicus and caused her to break into a sweat and feel faint. Soon she had an attack of severe vomiting. The pain and sickness continued; on Oct. 20th she noticed discoloration in the navel and on the following day this spread to the lower abdomen. She was seen by her doctor, who thought she had been kicked in the abdomen, and although she did not go to bed she was fairly comfortable. On the 30th she was again seized with severe pain in the vulva and abdomen accompanied by vomiting and faintness. She called in her doctor, who admitted her to a nursing home. The pains in the abdomen recurred at intervals of about 15 minutes. When seen on the 31st she said that her last period was one week late but she had had a thin pink discharge from the vagina on that morning.

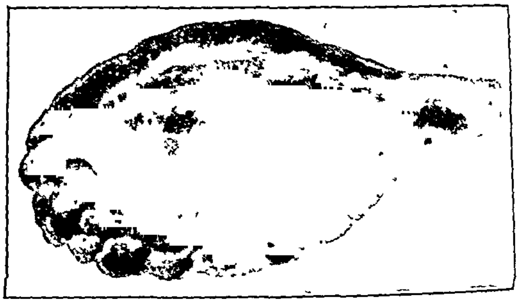
FIG. 1.



Showing "bruising" of the umbilicus and lower abdominal wall.

Examination.—She did not look anæmic. The pulse was 72 and the temperature normal. The abdomen was discoloured (Fig. 1). The bruising was just beneath the skin and the bright discoloration of the umbilicus showed that that was the part first affected. The lower abdomen was distended, slightly rigid, and tender, and there was movable dullness in both flanks. Nothing unusual was felt on rectal examination. A diagnosis of ruptured ectopic gestation was made and an operation advised.

FIG. 2.



The tube removed. (Natural size.)

Operation.—Median laparotomy below the umbilicus. There was no discoloration outside the peritoneum, but on opening the peritoneum the cavity was found to be full of blood. The right Fallopian tube was dilated at its outer end and surrounded by loose blood clot, but was lying free in the pelvis and not attached to any other structure. The outer part of the right tube was removed (Fig. 2) but the right ovary was left. The abdomen was closed without drainage. She made a good recovery.

The bruising was not the result of a retroperitoneal extravasation of blood from the pregnancy becoming attached to the parietal peritoneum. It must have come through the lymphatics at the umbilicus direct from the peritoneum into the skin and subcutis. I cannot find a record of any similar case.

A CASE OF ACUTE CHOLECYSTITIS.

BY J. H. PEEL, M.R.C.S. ENG.,
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A WOMAN, aged 62, was admitted to Hillingdon County Hospital complaining of abdominal pain and vomiting. She was found to have a large ulcerating carcinoma of the left breast, and the history of the carcinoma dated back for five years. She had had two operations, and had recently been treated by deep X ray therapy, which had failed to check the advance of the carcinoma.

On examination of the abdomen, a lump the size of a lemon was felt in the right iliac fossa. It was tender, tense, and cystic; it was dull on percussion, and there appeared to be an area of resonance between the lump and the liver dullness. The lump was fixed. The rest of the abdomen moved on aspiration. The patient did not appear to be very ill, and was not in ny pain, except on palpation of the lump. The emperature was raised to 101° F. in the evening; he pulse-rate was 110, and the respirations 24. There was no history of jaundice nor of kidney rouble. The urine was normal, and the bowels quite egular. The patient had vomited twice on the day efore admission.

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[2] Brit. Med. Jour., 1931, i., 396.

The diagnosis of secondaries in the peritoneum or he right ovary (breaking down) suggested itself, or possibly an appendix abscess. A laparotomy was performed, and the lump was found to be an enlarged and acutely inflamed gall-bladder. On palpating the neck of the gall-bladder a stone was felt in the position of the cystic duct. Cholecystectomy was performed. No stones were felt in the common bile-duct. On opening the gall-bladder after operation a single non-faceted cholesterol stone was found and the fluid distending the gall-bladder was faintly bile-stained mucus. There was no evidence of secondary deposits in the liver, peritoneum, or the uterine adnexa. The patient made an uneventful recovery from the operation.

SOME USES OF FARADISM IN TREATMENT AND DIAGNOSIS.

By H. W. Hales, M.D. Camb.

A woman, aged 42, sustained a motor accident which resulted in shock and pain in her back, sufficiently severe to keep her awake all night and produced by the slightest movement. A radiogram revealed a fracture of the right transverse process of the second lumbar vertebra. She always sat hunched up with her shoulders forward, supporting the weight of her body on the outstretched palms of her hands. There was a good deal of bruising over the left gluteal region, but no particular tenderness was noted here and radiography failed to reveal a fracture.

Diathermy and anodal galvanism to the lumbar region and coccyx did little to relieve her pain. I therefore tested the whole of the region between the first lumbar vertebra and the coccyx, extending four inches on either side, by the subfaradic test for cutaneous hyperæsthesia, according to the method of C. B. Heald.

In this test an indifferent electrode of moderate size is placed under the hand or at some point remote from the area to be tested; the other terminal is connected to a pointed electrode about one-sixteenth of an inch across. The current is so regulated that it is just imperceptible to sensation over a neighbouring area of normal skin. The electrode is then moved over the area to be tested. If the current becomes perceptible, the area where this occurs is charted and compared with the opposite side. Alternatively, a current which is just perceptible and quite painless over normal skin may be employed, and any definite increase in intensity or sign of pain noted as above. The alteration of the vibrating sensation of faradism to that of pricking or burning is a very definite sign and was originally described by Head in his classical paper. I have never found it present in a normal nerve.

The test showed a somewhat indefinite positive reaction for the spinal nerve immediately adjacent to the site of fracture. It was very positive, however, for the left posterior primary cutaneous branches of the first, second, and third sacral nerves. On testing this area, a particularly sensitive spot was found corresponding to the second sacral nerve. This spot was marked by a skin pencil. All four coils of the coil were put in the circuit, and the soft iron core withdrawn. The core was then suddenly inserted completely for a moment, with the pointed electrode over the marked spot. There was immediate relief, and apparently a complete cure of her symptoms in this region has resulted. As might be expected, the lumbar region of her back was still somewhat painful.

I have used the clinical application of this test for several years for the treatment of headache and allied conditions. A hypersensitive nerve, often the supra-orbital, is isolated with the usual small current, and then a strong current is applied for a moment. The results are often dramatic, and have usually been lasting. It has been employed in over forty cases, including neuralgia of several weeks' duration and severe influenzal headaches. The treatment is almost painless, and the percentage of successes is high.

Two theories suggest themselves as possible explanations of this phenomenon. The nerve sheath may be involved in minute external adhesions following hæmatoma or injury, and the sudden current may cause a contraction which breaks these. The nerve impulse is in the nature of an alternating current of 500 cycles, each of which consists of 10,000 high-frequency oscillations.[1] It is possible that the frequency in the painful nerve becomes slightly altered from that present elsewhere and thus causes pain. (Compare the hum present when an A.C. dynamo gets out of tune with the rest.) Possibly the faradic current overwhelms this non-synchronising current and then, when it has ceased, the normal condition of synchronisation is restored.

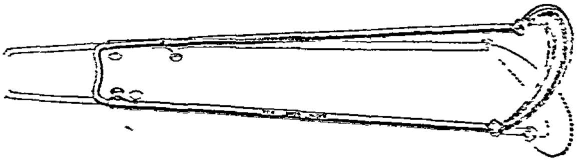
This method can be compared with galvano-acupuncture, and several patients have been relieved by the latter where the former has failed. I think that the method described is only effective for treatment where the nerve sheath is intact. The pain, which is relieved by galvano-acupuncture, is due to currents escaping from a nerve which is uninsulated owing to its destruction of its sheath as a result of injury.

The subfaradic test is of value in detecting cases of malingering. If the patient is prevented from seeing the test and the same spot is accurately localised on several different occasions, there can be little doubt that a pain is genuine. If, however, there is a wide divergence in the site of pain at each test, and there is reason to suspect malingering, doubt will be very much intensified by this method.

NEW INVENTIONS

A NEW HIP SPLINT.

This splint is intended for temporary use in motor accidents, and for moving patients by road. As will be seen from the illustration it is based in all particulars upon the principles of a Thomas hip splint and packs flat for use in an ambulance. It has a swivel joint on either bar below the buttock half circle. This allows for the splint being used for the right or left lower extremity as required. The anterior half circle being removed allows of application with ease and without pain.



Messrs. Down Bros., St. Thomas's-street, London, S.E., have made the splint from my design.

H. E. Rawlence, M.D., F.R.C.S.Edin.

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[1] As E. D. Adrian suggested in his Oliver Sharpey lectures in 1925, The Lancet, 1925, i., 1229.

MEDICAL SOCIETIES

ROYAL SOCIETY OF MEDICINE.

SECTION OF TROPICAL DISEASES AND PARASITOLOGY.

Dr. J. GORDON THOMSON, the President, took the chair at a meeting of this section on Jan. 7th, and Prof. W. SCHULEMANN, of Elberfeld, read a paper on

Synthetic Antimalarial Preparations.

He began by surveying the history of the use of quinine and of research into the nature of the malaria parasite and the rôle of the mosquito. Roehl's technique of experiments on canaries had made it possible to assess many groups of drugs in the laboratory, and the treatment of general paralytics with malaria, inoculated through the mosquito, provided a means of carrying out clinical tests of drugs on the human subject in northern climates. Quinine consisted of a quinoline ring bound to a basic heterocyclic group. An extensive search for other combinations effective in malaria had shown that the only ones with any definite action were methylene-blue and salvarsan. Investigators had prepared an extensive series of synthetic products with a constitution similar to that of quinine. It had been generally assumed that an antimalarial drug must contain a quinoline nucleus, with an aliphatic basic group bound by a carbon bond to the fourth position of quinoline. These researches had been unsuccessful. Prof. Schulemann and his colleagues had based their experiments on methylene-blue, substituting in one of its aromatic amino-groups an aliphatic basic group in place of an alkyl radical. Roehl had found this compound to be effective in bird malaria, but it had the definite characteristics of a dye. They had therefore transferred their experience to the quinoline group, uniting the basic aliphatic radical to the quinoline nucleus by a nitrogen bond. The first compound which they had prepared (amino-quinoline) had had a marked therapeutic action on proteosoma infection in canaries. Proceeding from this starting-point, and with full collaboration with physicians, the workers had produced a large variety of substances by changing the various components of amino-quinoline in different ways.

Roehl had tested all these compounds in animal experiments, and plasmoquine had been selected for practical clinical investigation. Prof. Schulemann demonstrated the formulæ of quinine and of plasmoquine side by side on the same chart. The gross formulæ and the molecular weights differed very little. Sioli, he said, had found plasmoquine therapeutically effective in malaria artificially inoculated for general paralysis, and Roehl had shown its action in natural human malaria; the latter worker had *also discovered that it destroyed the gametocytes* of *Plasmodium falciparum*, a property which quinine did not possess. This surprising result showed that plasmoquine was not a substitute for quinine, but had different therapeutic properties.

The three types of plasmodium, it was known, reacted to drugs in a different way, and it was also probable that the parasites reacted in different ways at various stages of their development. Work in British India had shown that with plasmoquine, alone or combined with quinine, it was possible to reduce the relapse rate of tertian malaria from 50 per cent. (the usual rate with quinine) to 2–5 per cent In subtertian malaria the results were not quite so satisfactory, but in this variety only was it possible to assess the value of plasmoquine at all accurately. Its action on the gametocytes of tertian malaria was not definitely known, and all that should be asserted was that it acted on the schizonts as well as on the gametocytes of *P. vivax*.

Quinine acted effectively on the schizonts of *P. falciparum* and allayed the acute clinical symptoms, but it could not inhibit the development of gametocytes and even appeared to stimulate it. Plasmoquine, while it had practically no effect on the schizonts, destroyed the gametocytes in a few days, but it did not inhibit their formation. Minimal doses which were too small to destroy the gametocytes nevertheless prevented them from infecting the anopheles. Here, for the first time, it appeared possible to break the cycle man-mosquito-man, and work along these lines was being performed in West Africa, but plasmoquine had in no way superseded the usual sanitation methods.

Prof. Schulemann exhibited a diagram representing the development of the malaria parasite. In subtertian malaria, he said, quinine broke the cycle at the stage of schizogony, while plasmoquine broke it at the stage of gametocyte formation. However, it was not known which phase gave rise to relapses and what drug affected that phase; nor was it known what drug affected the development of the sporozoite into a ring form. Warrington Yorke and Macfie had shown that quinine had no causal prophylactic action in malaria, but James had shown that plasmoquine had that action. This work was the starting-point of important future research. It ought to be possible to discover new drugs which might attack the cycle at other points. The lecturer mentioned recent work along these lines.

Mietzsch and Mauss at Elberfeld had formulated another heterocyclic ring system and the resulting compounds had been tested by Kikuth. The new product differed in its action from plasmoquine and would probably be effective against the schizonts though not against the gametocytes. It seemed to have advantages in dosage and duration of treatment, and to reduce the number of relapses. It was known provisionally as "erion," but this name was not to be used in future.

Prof. Schulemann concluded by emphasising the importance of collaboration with other investigators, and paid a tribute to the help he had received from workers in the British Empire.

DISCUSSION.

Sir HENRY DALE pointed out that work of this kind did not follow logical sequence, although the subsequent account of it might be logically expressed; its success was largely due to careful and patient research on the lines of trial and error.

Lieut.-Colonel S. P. JAMES remarked that the observation of the action of plasmoquine on the parasite in its different stages had led to important changes in current ideas and aims in the chemotherapy of malaria. Whereas, formerly, it had been generally believed that the problem was the single one of finding a drug which would act more effectively than quinine *in malarial* attacks, the problem was now realised to be fourfold. Plasmoquine was the r drug known at present to destroy the sporozoites, even it would not give complete protection under cting conditions. Quinine was effective against asexual parasites. On the sexual forms plasmone acted excellently. in smaller doses than against sporozoites. The speaker doubted whether smoquine really reduced the relapse rate; in lignant tertian malaria it was no more effective this respect than quinine. This had been shown five cases at Horton. One of the difficulties in praising a drug was the existence, in each species parasite, of various strains, differing in virulence. inine had proved effective against *P. falciparum* ection from India and West Africa. but not against ains from Rome and Sardinia. It was important know whether the good results obtained with the w drug could have been obtained with quinine. r the chemoprophylaxis of malaria a drug was eded with the same action as plasmoquine, but s toxicity; for chemotherapy one was needed ich, given in moderate doses for a short period, uld not only cure the attack. but prevent relapses.

Prof. WARRINGTON YORKE wondered whether it s really true that *inoculated sporozoites immediately* tered the red corpuscle. He thought it possible at in ordinary malignant tertian malaria the rings ltiplied in the red cell. Before plasmoquine had en introduced, gametocytic crescents had been own to disappear from the blood under a heavy se of quinine, and possibly they did not live very ng in any case. If any real advance in chemoerapy were to be made, the biological side must not burked. Quinine was a unique and remarkable ug. and it was not creditable that so little was ow about its action.

Prof. ROBINSON described his investigations of bstances of the plasmoquine type. He was, he id. experimenting on derivatives with a short carbon ain, with one alkyl group at the end. Whenever departed from Prof. Schulemann's work, the tivity seemed to disappear.

Sir MALCOLM WATSON said that the gamete did t come off where Prof. Schulemann had shown it. e would himself have more faith in a drug that stroyed the schizont than in one which only acted pon the gamete. He hoped to try plasmoquine n the population of a large copper mine near the ongo border. where accurate observation was possible. alaria in a cold climate was not always the same ing as in the tropics.

Dr. P. H. MANSON-BAHR stated that patients ith benign tertian malaria had been particularly rateful for plasmoquine. Clinically and expenentally, plasmoquine was specific for *P. vivax;* had less action on the quartan and still less on the erozoites of the subtertian forms. Its most emarkable action was upon the gametocytes. specially in combination with quinine. It had no itter taste, and did not readily provoke toxic mptoms in children; it was especially useful for regnant women, for it was harmless and tended to revent relapse; and it was valuable in the onvalescent stages of blackwater. Possibly plasmouine acted as a chemical alterative of quinine, nhancing its value. An idiosyncrasy undoubtedly xisted, and plasmoquine cyanosis appeared, especially n recent victims of malaria who had basophilic egeneration of the blood corpuscles, but it was not very dangerous condition. It was undesirable that patients should dose themselves, but this possibility fforded no reason for condemning the drug out of hand. The prejudice against it in West Africa probably existed because over 90 per cent. of the malaria in that country was subtertian.

Dr. M. A. ARAFA described the results of plasmoquine treatment on over 100 patients in Cairo. Combined with quinine it caused no toxic symptoms and cured the *intestinal and hepatic disorders* associated with malaria. The results of the intravenous injection of plasmoquine compound were not better than those of oral administration, and the blood pressure tended to fall. The most convenient dose was 0·04 g. plasmoquine and 1·2 g. quinine daily for one week, followed by four days' rest and three days' treatment alternately for the next five weeks. This combined interrupted treatment sufficed to clear the blood of both rings and crescents in an average of four days and without toxic symptoms. Only three relapses had occurred.

REPLY.

Prof. SCHULEMANN, in reply, emphasised the necessity for distinguishing carefully between tertian and subtertian malaria. In the subtertian form plasmoquine ensured that the gametocytes should be rendered ineffective in a day or two. It was necessary to exercise great caution in administering new preparations, because substances with short side-chains had been known to cause disorders of the central nervous system which were not apparent in experimental animals. It was neither necessary nor desirable to give pure plasmoquine intravenously, for it was not effective in coma, the only condition in which intravenous injection was requisite, and it acted upon the bundle of His to cause heart-block.

MEDICAL OFFICERS OF SCHOOLS ASSOCIATION.

AT a meeting of this association, held at University College. London, on Jan. 8th, with Dr. G. E. FRIEND, the President, in the chair, a discussion took place on

Physical Education in Schools.

Mr. T. N. MORTIMER BOOTH (physical instructor, Christ's Hospital) said that the admitted lack of any uniform system in schools might be largely due to the difference in the type of personnel responsible for the methods adopted, and to the lack of the complete training of the teacher The relation of the physical to the mental development of the boy should always be kept in mind; then a due relation would be observed to the other subjects in the curriculum. It was not now believed that the ordinary games of school life sufficed for every type of boy, there should be close inspection and control by the competent physiologist. No system could well be applied to all types of school, and the numbers of pupils to be dealt with entered into the question very importantly. Also there still existed the old conflict between the methods evolved by the Army school and by the Board of Education. It was wrong. in the speaker's view. to regard the Army instructor as too limited in outlook. to consider that his exercises were fit for adults only, and that his drill did not make for mental alertness. So-called "drill" Mr. Booth did not consider soul-destroying if it was done in the right way. It should not be thought enough to lump all boys together because they were of the same age, for all sorts of problems were presented by the individual. In the experience of all instructors, there were boys who hibernated during school hours and only emerged from their torpor as meal-time approached. None but the fully trained could be regarded as suitable for school instruction, and of these the supply must necessarily be limited. It was recently declared that it required three years to turn out a fully competent woman instructor; also that the physical education of our sons was half a century behind that of our daughters. The director of physical education should see each boy with his form daily, but the difficulties in the way were immense. In a large school there might be 20 or more forms, and the later hours of the day were not suitable for the purpose. Perhaps more time would be assigned by headmasters for physical education when a boy was allotted so many marks in his school certificate for his chest expansion. How should the results of physical education be tested, and by whom should the testing be done? On one hand it was suggested that the physical training expert should have the matter largely in his own hands, and that he should even be expected to advise the headmaster on questions of food and clothing, the medical officer being very much in the background in this respect, as he was associated in the mind of the boy with the stethoscope and disease. The practical experience at Christ's Hospital, however, went to prove the reverse of this—namely, that the medical officer should be in the foreground and be associated with physical fitness. The study of biology should greatly facilitate a greater interest being taken by the boy in the function and condition of his own body. At Christ's Hospital Dr. Friend saw every boy, apart from cases of sickness, three times every term for purposes of measurement; and the records constituted valuable data, which were subsequently available for both the medical officer and the instructor. Apart from the preparatory school, there were 700 boys, aged from 10 upwards, and besides leading a full and active life out of school at the games in season, they took part in such domestic routine as cleaning their shoes, making their own beds, and serving at table, so that little time was available for organised physical training in out-of-school periods. In this school a compromise in the way of exercise in proper costume between 10.30 and 11.5 A.M. each morning had worked happily for years, and resulted in the second part of the morning's studies being attacked with enhanced zest.

DISCUSSION.

The PRESIDENT showed a series of graphs illustrating seasonal variations in weight and measurement of the boys at Christ's Hospital, and including the results of the war rationing.

Dr. MURRAY LEVICK said that the London University advisory committee on this subject (of which he was a member) had fully considered the fact that physical fitness of school boys and girls depended not on exercises alone, but on the four factors: exercises, diet, atmospheric hygiene, and a properly arranged time-table. Juvenile health had reference to many subjects with which the schoolmaster could not be expected to be expertly conversant, therefore the hygiene of a school should be supervised by a specialist. At many schools the meals served were sadly lacking in vitamins. The breakfast at one large public school, for instance, consisted of white bread and butter, tea, kippers, marmalade, or jam. At another the only meal between midday and breakfast the next morning consisted of white bread and butter and one of the three following: potted meat, cake, sardines. The director of physical education in a school should be able to coöperate with the medical officer in the supervision of the school dietary and the ventilation of the school rooms and dormitories. Girls' schools were far ahead of boys' schools in the matter of physical education; and he advocated starting a three months' course in physical education for masters in charge of games at boys' schools. He also thought general practitioners, fulfilling the post of medical officer at a school, should pay regular visits to the school and supervise the choice and serving of the foods.

Major GARNIER (superintendent of the Lucas Tooth Physical Training Institute, Bermondsey) described his methods. He found it essential, he said, to have an attractive programme, otherwise the youth it was his special aim to secure would not continue to attend. His view was that three years' training was needed to make an efficient whole-time instructor. His pupils ranged in age from 14 to 44, and he had now 250.

Mr. F. CAHILL pleaded for an immediate practical outcome of this meeting. He was disappointed with the way in which the Board of Education had attempted to deal with this question.

Mr. R. E. ROPER exhibited some graphs with the object of showing that there might be a causal relation between a low or inadequate dietary and the onset of a definite cerebral disturbance. One showed that a period of concentracted cramming for examinations coincided with reduced measurements and poor appetite. In another, a boy committed thefts and other misdemeanours when his weight was at its lowest.

Dr. G. P. CROWDEN considered that the first care of the school doctor should be devoted to diet; it must not be assumed that the nutrition of the school boy would look after itself. Training should be placed next. The efficiency of the school medical officer was not to be judged by the extent of his practice; his work in the school life was preventive. Unless he knew what was necessary in this way he would not be able to control the conditions which would lead to the maintenance of the boy's health and proper fitness. He agreed with Mr. Booth's suggestion that marks should be given in the boy's certificate for physique, as that would greatly encourage him to take an interest in his physical condition. Three bodies which had greatly interested themselves in this question were the British College of Physical Training, the Gymnastic Teachers' Institute, and the National Society of Physical Education. These had now amalgamated to form the British Association for Physical Training. He preferred the term "physical education," for that implied a study of school hygiene, physiology, and anatomy. Over a thousand school teachers had taken the association's certificates. Leeds had taken the first organised step to provide training for those who wished to become physical instructors, for both elementary and public schools, and he hoped that the London County Council, or London University, would see its way to take up this subject and raise it to University status.

Dr. L. R. LEMPRIÉRE said he had been medical officer of Haileybury College for 22 years, and had control of the physical training at it. It had been of great advantage to him, for it enabled him to know the boys, and to study them when they were on the move, in a way that would not have been possible otherwise. Two types of physical training were at present carried ut in schools. One was the free-standing exercise' one by the entire school probably once a day, and ntrolled largely by the senior boys, who had been ught their part. The other kind consisted of ee-standing work plus apparatus work, carried ut by only part of the school and for a short time, nd supervised and directed by trained instructors. n a general way, ground work alone was not sufficient; nd he questioned whether the senior boy could be apable of instructing adequately. The boys who ost needed physical training were those of subormal physique under 16 years of age. Certainly he best results he had seen came from a combination f the two systems. A good stance, alertness, and apid response to command he regarded as very mportant.

Mr. BROCHS spoke from a particular experience of econdary schools, and highly recommended a book n the subject which had been issued by the Board of Education. Just before and during examination ime there was a strong tendency to allow exercises o be neglected, yet that was the time when they were most beneficial.

The PRESIDENT said the control of physical training n schools could not be the sole matter of the medical fficer, nor even of the director of physical education in the school; it depended on a correlation of the interests and the activities of the whole of the school life.

PATHOLOGICAL SOCIETY OF GREAT BRITAIN AND IRELAND.

A MEETING was held at Guy's Hospital on Jan. 8th and 9th, Prof. R. DONALDSON being in the chair.

R. A. Q. O'MEARA (Dublin) discussed the biochemical mechanism of the formation of acetylmethylcarbinol, which is of interest to bacteriologists because it is the basis of the Voges-Proskauer reaction. —S. J. HARTFALL and L. J. WITTS (London) described their extensive observations on persons with achlorhydria who may have normal blood or may suffer from secondary microcytic or macrocytic Addisonian anæmia. Their gastric juice obtained with histamine will act on minced beef with the production of Castle's factor which is effective in curing pernicious anæmia.—C. J. POLSON (Leeds) described three cranial tumours which produced the chiasmal syndrome by involving the optic tracts: a pinealoma, a carcinoma of the ethmoid, and a tumour of Rathke's pouch.—J. DAVIDSON (Edinburgh) in a long series of cases of fatal eclampsia found the liver necrosis variously situated in the periphery or centre of the lobules. The kidneys relatively rarely showed tubular degeneration and hæmorrhagic lesions were uncommon in both organs.—J. W. ORR (London) described the reaction of the lymphocytes and histiocytes of the rat's spleen to infection with streptococci.—A. E. BOYCOTT and C. L. OAKLEY (London) gave an account of the extensive pleural effusions which are the cause of death in rats living in air containing 95 per cent. of oxygen, and of their failure to make rats anæmic by keeping them for many weeks in 50–60 per cent. oxygen.—J. H. DIBLE (Liverpool) by chemical analysis found a good deal more fat in the parts of human hearts showing histological fatty degeneration than in the neighbouring normal muscle.—G. R. CAMERON (London) described how earthworms react to foreign bodies by phagocytosis by the cœlomic cells, by expulsion through the dorsal pores, by extrusion through the nephridia, and by getting rid of the affected parts altogether by autotomy.—C. E. JENKINS (Salford) had deduced a formula for calculating the volume of a red corpuscle which he made to be about 82 cubic micromillimeters. He also described an ingenious method for ascertaining the relative volume of red cells in blood by measuring the relative volume of plasma by adding laked blood. The method gave results about 10 per cent. lower than those given by the hæmatocrit.—W. M. CROFTON (Dublin) showed lantern slides of microbes which he had isolated from sarcomata and claimed to have produced sarcomata in rats with them; J. A. MURRAY had seen the lesions and thought they were abscesses.—HELEN CHAMBERS and GLADWYS M. SCOTT (London) showed that emulsions of rat sarcoma developed some substance after standing a short time which on inoculation into rats rendered them refractory to tumour implantation. No protective effect had been obtained with any preparation which was certainly free from cells, though it was not clear that cells as such were responsible.

T. LUMSDEN (London) continuing his observations with the euglobulin fraction of an anti-human-cancer sheep serum containing the anti-malignant bodies, found that the serum caused necrosis of spontaneous mouse tumours when it was injected into them, and that this so immunised the animals that autoplastic transplantations made a few days later nearly always failed.—C. H. ANDREWES (London) showed that several different fowl sarcomata could be transplanted successfully into pheasants though they could not be carried on in these birds.—S. P. BEDSON (London) gave a number of reasons for thinking that the elementary bodies in psittacosis were indeed the causative virus of the disease, and J. C. G. LEDINGHAM (London) gave a convincing demonstration that during an attack of vaccinia a rabbit develops agglutinins for the corresponding vaccinial bodies which increase and decline in the same sort of curve as is familiar in the antibody reaction to bacteria.—W. J. ELFORD and C. H. ANDREWES (London) showed that each sort of bacteriophage had a characteristic size varying in different kinds from about 8 to about ·75 micromillimetres.—R. W. FAIRBROTHER (Manchester) had found that mixtures of vaccinia virus and antiserum which were neutral by the skin test would kill rabbits on intracerebral inoculation.—A. T. GLENNY and MOLLY BARR (London) showed, in a series of elegant experiments, that mixtures of diphtheria toxin with some preparations of antitoxin might dissociate so much after inoculation as to kill the test animal whose blood might contain enough free toxin to kill a second animal in quite small doses. They pointed out the consequent danger of toxin-antitoxin mixtures prepared for immunisation and said that it was difficult to devise a perfectly satisfactory animal test of their safety for human use; P. HARTLEY agreed with this, and urged that for this purpose toxin should always be replaced by toxoid.—A. FELIX (London) discussed the factors which determine the type of antibacterial antibodies found in normal animals.—H. J. PARISH (London) pointed out that cultures of the meningococcus and other delicate bacteria could be satisfactorily preserved alive for a long time by covering them with liquid paraffin.—J. G. THOMSON (London) gave an interesting account of the occurrence of the protozoon *Glugea anomala* in sticklebacks near London.—MARY M. STEWART (Aberdeen) described the bacterial flora of the skin and alimentary canal of the haddock.

(*Continued at foot of next page.*)

REVIEWS AND NOTICES OF BOOKS

Radiologische Praktika.

Band XVIII. *Einfuhrung in Die Röntgen-Therapie Erkrankungen.* By Priv.-Doz. Dr. J. PALUGYAY. Leipzig: Georg Thieme. 1931. Pp. 103. M.10.

THIS is in many respects a valuable monograph on the X ray treatment of surgical diseases: it is a short survey of the present position in the application of X rays to the various conditions covered by the title, and is intended to serve as an introduction to the study of more elaborate treatises, to the position of which it makes no pretence. General biological and technical details are omitted, but fairly close accounts of the techniques used by the author or to be found in medical literature are given. Throughout, the doses are stated in international *r*, and it is pleasant to see that the author has freed himself sufficiently from the shackles of the unit skin dose, not only to employ the *r*, but also to give the doses which should be received at the lesion below the surface, and not merely the dose on the surface.

The two sections of the book which will probably be of greatest general interest are those devoted to the treatment of surgical tuberculosis and malignant disease respectively. With respect to the former, the author advocates homogeneous irradiation, for instance, of the joint, with very small doses of penetrating radiation, even though the lesion might be thought to be accessible to larger doses of softer rays. It is maintained that it is "better to give much too little than a little too much" in the treatment of tuberculous lesions, doses of the order of 25–50 r. being recommended per sitting. It is perhaps unfortunate that no statistics regarding the results of these techniques are given. The problems of the X ray treatment of malignant disease are very cautiously treated, it being maintained that in many cases, almost most cases, the treatment is only palliative. The general considerations here given form a clear account of the fundamental difficulties, and it is insisted that the problems are not merely those of X ray technique, but call for careful regard of the patient as a whole. Where the techniques are given, there are suggestions for dosage in the treatment of malignant disease in various parts of the body.

The book is, unfortunately, not illustrated, and a few diagrams have replaced suitably some of the text. It is very well printed and produced, though proper names in the text seem sometimes unduly Germanised. A bibliography is included, and appears a reasonable selection from the mass of material available.

(Continued from previous page.)

Demonstrations included the following:—R. J. V. PULVERTAFT (London): (1) A gumma of the thyroid gland in a girl of 18. (2) Leiomyoma of the renal pelvis. C. POLSON (Leeds): (1) Complete (post-traumatic) stenosis of the larynx. (2) Hæmochromatosis and primary cancer of the liver. H. ROGERS (Bristol): Bilateral suprarenal tuberculosis with a tuberculoma of the basal ganglia of the brain. H. E. HARDING (Sheffield): (1) A large cyst of the spleen containing mucoid material and lined by squamous epithelium. (2) An unusual mass in an epididymis: ? granulomatous, ? neoplastic. H. H. GLEAVE (Liverpool): Periarteritis nodosa. ELIZABETH H. LEPPER (London): The use of tellurite-containing medium for the isolation of streptococci. T. HARE (London): Foot-and-mouth disease lesions in the ear epidermis of inoculated guinea-pigs. F. A. KNOTT (London): (1) Specimen and sections of Gaucher's splenomegaly (splenectomy). (2) Specimen and sections of active ulcerative colitis (colectomy). JOAN M. ROSS (London): (1) Chorion-epithelioma secondary to a testicular tumour. (2) A further case of splenomegaly of unusual type. (3) Primary carcinoma of the Fallopian tube. C. OLDFIELD and M. J. STEWART (Leeds): (1) Endometriosis carcinomatosa. (2) Liposarcoma of broad ligament. ELLA M. HICKMAN (Leeds): Neurofibromatous epulis.

The Chest in Children Roentgenologically Considered.

By E. GORDON STOLOFF, M.D. Foreword by BELA SCHICK, M.D. Annals of Roentgenology. Vol. XII. New York: P. B. Hoeber. Pp. 432. $15.

THIS study is largely a clinical one, by an author who is displayed as an expert radiologist as well as a sound clinician. This combination of specialties is rare in England where it is considered to be an advantage for the patient to have the opinions of two medical men who look at his case from different angles. Much labour has evidently been devoted to this work and many of the observations extend over a long period of time. The serial radiograms are of great value in the study of the evolution of certain pathological processes, particularly tubercle and the pneumonias. It is especially difficult to get good radiograms of the chest in children. In view of the excellent quality of these it is disappointing that little is said about technique. It would be interesting to know the focus-film distance used, whether 6 ft. or the more American fashion of 4 ft. Another omission is the lack of reference to appearances found in radiograms of the normal chest in children of various ages.

A detailed description of the topography of the interlobar fissures is given, many radiograms, anterior and lateral, illustrating interlobar effusions, and others showing the variations of technique which enable pathological changes in the large interlobar fissure to be interpreted. The importance of the lordotic position is well seen. It is not quite clear whether the author believes it possible to visualise these fissures in normal radiograms, the lesser in postero-anterior, and the greater in lateral views. In Fig. 177, the author refers to a *hair-line pleural thickening* of the small interlobar fissure; as a matter of fact a similar hair-line is seen in other radiograms throughout the book, particularly in Fig. 75. It is likely that these fissures can be visualised in 80 to 90 per-cent. of radiograms of the healthy chest. A large and important section of the book, with many serial radiograms, illustrates the evolution of the primary tuberculous complex in children—that is the primary focus, with its regional lymph nodes. This conception of the development of the lesion we owe to Ghon and Hamburger, and to the work of the last-named authority at least some reference should have been made.

Such extreme enlargements of lymph nodes as are illustrated in this book are uncommon in infants and young children in England. When the primary focus is invisible these minor lymph node enlargements may indicate possible localisation of the primary focus. As Parrot put it—these lymph nodes act as "mirrors of the lungs." In common with other American workers, Dr. Stoloff apparently devotes much attention to the radiological study of the more acute chest conditions, particularly the pneumonias. He reproduces interesting serial radiograms of a ition arising in the course of pneumonia, which alls "aseptic" or "aputrid" necrosis.

is is a most comprehensive work deserving close y.

ent Advances in Organic Chemistry.

xth edition. By ALFRED W. STEWART, D.Sc., ofessor of Chemistry in the Queen's University Belfast. London: Longmans, Green and Co. 31. In two volumes. Pp. 421 and 432. 21s. ch volume.

o all interested in the development of organic nistry these summaries by Prof. Stewart are luable; his style is always lucid and his choice material excellent. The first volume contains ter suitable for third-year students and forms ntroduction to the second which is intended for ours students and post-graduate workers. Vol. I. s with a short historical survey of the main of progress of organic chemistry in the latter of the nineteenth century while the first chapter ol. II. deals with the advances of the last 25 years. ongst the fresh subjects treated are several of rest to the pure organic chemist such as strainless on rings and a number of terpenes and alkaloids. lical readers will look in vain for summaries of chemistry of the vitamins, hormones, and allied stances.

antitative Organic Microanalysis.

y FRITZ PREGL, D.Sc., Ph.D., Professor of Medicinal hemistry; Principal of the Medico-Chemical nstitute of the University of Graz. Second English dition translated from the third revised and nlarged German edition, by ERNEST FYLEMAN, .Sc., Ph.D., F.I.C., Consulting Chemist, Sutton, urrey. London: J. and A. Churchill. Pp. 237. 15s.

HE methods of Prof. Pregl are so well known as to be regarded as classical. The English trans- ion of his book, which appeared some years ago, ame authoritative among works on quantitative anic analysis. In the third German edition which Dr. Fyleman's present translation is based, ny of the chapters have been rewritten, and it is rticularly interesting to see that Prof. Pregl has wn good judgment in selecting for revision just se which contained matters puzzling to the ginner. He has added an interesting and important tion on the identification of organic compounds d groups. The work is a very valuable one and the nslation is good.

ext-book of General Bacteriology.

Tenth edition. By EDWIN O. JORDAN, Ph.D., Professor of Bacteriology in the University of Chicago and in Rush Medical College. London: W. B. Saunders Co., Ltd. 1931. Pp. 819. 28s.

GOOD text-books, unlike old soldiers, are not mortal. A few, in the hands of succeeding genera- ons of editors, seem continuously to renew their outh but it is the fate of the majority that, after ourishing for a certain period, they appear no more. his is not really strange, for it is often a harder task revise a book effectively than it can ever have been write it. The introduction of new matter into an isting framework and the adaptation of chapters hich must be modified, and yet are too good to be crificed and rewritten, imposes a great strain pon the ingenuity, common-sense, and pride of an author; so that as a book ages it often degenerates from a continued narrative into something of a scrap-book and thus passes to its doom. No such improvisations and makeshift alterations are to be found in Jordan's text-book. It remains a most admirably lucid exposition of this subject; short, concise, yet covering a wider field than most text-books of bacteriology which come into the hands of medical students. One of its major virtues is that subjects on the edge of medical bacteriology, and those verging towards the more technical aspects of the subject, are especially well treated. Certain criticisms might be made. The important subject of bacterial variation is barely touched upon, whilst the use of the term "phase" in speaking of the $S \rightleftharpoons R$ states is unfortunate, since it has been widely adopted, at least in this country, for the H-antigenic type and group states of certain Salmonella which were discovered by Andrewes. The type of filter illustrated in Fig. 43 is not one in common use, whilst the sense in which the term "mixed and secondary" infections (p. 143) is employed is hardly the usual one. Such blemishes are few and are not serious.

This is indeed a fine mellow book, well balanced pleasant to read, and beautifully produced.

Experimental Syphilis and Framboesia.

With Special Reference to the Comparative Pathology and Immunology. By S. MATSUMOTO, Professor of Dermatology and Syphilology, Kyoto Imperial University. Kyoto: Instit. Dermatosyphil. Universitas. Imperialis. Pp. 408.

IN this monograph the results of work on experimental syphilis in rabbits, including the comparative study of framboesia and other spirochætoses are fully described by Dr. Matsumoto. The first part of the work is devoted to an exhaustive account of the macroscopical and microscopical appearances of the diseases considered, while the second part is concerned with immunity in rabbit and mouse spirochætoses. The author states that his purpose in publishing these experimental results is to show the basis on which his theories of "syphilis immunity" are founded. He developed this theory in a communication to the Eighth Congress for Dermatology and Syphilology held in Copenhagen on August 6th last. An interesting terminal section on sero-chemical changes is included. The monograph is illustrated by excellent photographs.

Sevenoaks Essays.

By GORDON WARD, M.D. London: Metcalfe and Cooper, Ltd. 1931. Pp. 316.

DR. Gordon Ward in this collection of interesting and amusing essays is helping to discharge a national task—namely, the preservation of local records necessary for the historical understanding of much of our social environment to-day. The chapters represent gleanings from a large number o old documents which, for the most part, have found their way to the public library at Sevenoaks; no area is dealt with except that of the Sevenoaks Urban and District Councils or, in more ancient parlance, of the three Hundreds of Codsheath, Westerham, and Somerden. The limits thus laid down for himself by the author have been generously interpreted, for the material is of the most heterogeneous description, dealing now with the careers of local worthies, now with Roman remains, now with the construction of palaces, and now with the demolition of cottages; we meet with kings and earls, yeomen and peasants, villains and eccentrics. An interesting little chapter on "beating the bounds" sets out examples of the curious landmarks that were employed to mark parish areas in comparatively recent times; several chapters describe interesting legal proceedings and others give amusing biographical and topographical information, when the preservation of the ancient spellings often gives force to the remarks.

Dr. Ward's object in writing this book has been to awaken interest in the study of old records and quicken efforts to preserve them, inasmuch as the contents of muniment rooms and other storage places are often in danger of destruction. Experience has shown that from such material the real history of the countryside can be gathered, while, as this volume shows, apparently dry-as-dust documents can be made interesting to the general public if the editor of their contents has the skill necessary for the work. Dr. Ward urges all who have documents of local interest to imitate the example of Lord Middleton who has given to the Sevenoaks library much that has found its way into this compilation.

Only one medical character receives more than a casual reference, and that is Dr. Thomas Fuller whose Latin epitaph can be read in St. Nicholas Church. He died two hundred years ago, and he wrote in the latter phase of his long life "Pharmacopœia Extemporanea, or a Body of Prescripts, in which Form of Select Remedies, accommodated to most Intentions of Cure usually occurring in Practice . . . and so on," from whose pages amusing and nauseating quotations are sometimes met with. He also wrote a book upon eruptive fevers, in which he pointed out how to diagnose flea-bites. The last of the Bosvilles of Bradbourne, a very old local family, made a curious will which has a medical interest. He lost the whole property by gambling, regained it presumably in similar manner, stopped play for ever and willed the property, first to a clerk in the India Office who had been polite in the payment of dividends, and then to his medical adviser.

The Scientific Detective and the Expert Witness.

By C. AINSWORTH MITCHELL, D.Sc.Oxf. Cambridge: W. Heffer and Sons, Ltd. 1931. Pp. 242. 3s. 6d.

THE machinations of the criminal and the investigations of the detective, professional or amateur, have become for the last few years a subject of highly popular interest, quite a proportion of popular reading for pleasure being represented in the pages of what are inclusively termed "shockers." The literary quality of these stories is extremely varied, being with some of the authors really high, and with a larger fraction quite low, but apparently readers medical or lay, may derive thrill or shock from each class, without feeling the difference. Indeed, the medical reader may now and again find in the most slovenly production, ingenious adaptations of medical and scientific possibilities together with audacious impossibilities, and, when preposterous episodes are detailed because a good story could not get on without them, gratitude is due to the author. But medical readers resent exercises of sheer fancy, when accompanied by detraction of their profession. This resentment is justified with monotonous frequency.

Dr. Ainsworth Mitchell has written a handbook which might serve as a source of inspiration to the intending parents of a shocker, for the plots of admirable stories of the kind will be found in his pages; he has provided a book of reference from which these authors could obtain exact instruction as to what they can and what they cannot make a villain do, while still conforming to right principles of science. The book contains an interesting chapter on graphology. Experts in handwriting have come in for a full share of the strictures that have been passed upon expert evidence in general, but Dr. Mitchell, in recording the work mainly of an American, Mr. A. S. Osborn, lays down rules for the detection of the forger of a very practical sort. The slips which the forger might make are so definitely pointed out that the publication of the information might be held to be dangerous. A criminal, who knew beforehand what are likely to be the main points of resemblance and the main points of difference brought forward, in a comparison of a genuine with a false document, would be on the alert to see that his fabrication passed the tests of such a parallel investigation.

ERRATUM.—On page 87 of our issue of Jan. 9th, in a review of Kessler's "Accidental Injuries," the number of pages is given as 71, the last figure having dropped out. The actual number of pages in the volume is 718.

REPORTS AND ANALYSES

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PRECAUTIONS AGAINST INFLUENZA IN IRELAND.—The Department of Local Government and Public Health of the Irish Free State has issued a circular-letter to the various local health authorities dealing with the precautions th should be taken to prevent the spread of influenza. Sanitar authorities are advised to formulate schemes for dealing with outbreaks of the disease, should they occur, and these schemes should include the coördination of medical and nursing facilities. Consideration should be given to the provision of hospital accommodation for severe cases. Acute primary pneumonia and influenzal pneumonia are already compulsorily notifiable, and the Department suggests that a system of voluntary notification of influenza should be established. The letter goes on to point out the usual modes of transmission of the infection of influenza by coughing, sneezing, loud talking, and warns against crowding in public resorts or public vehicles. Children from infected houses should not be allowed to attend school, and cases should be isolated if possible.

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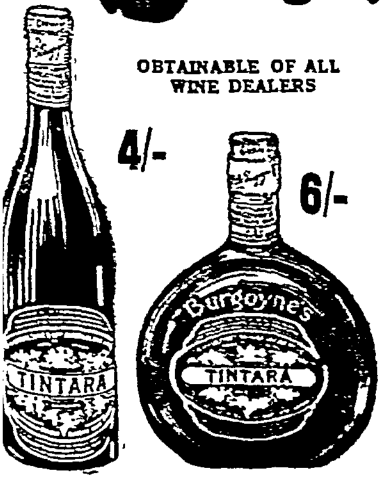

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THE LANCET.

NDON: SATURDAY, JANUARY 16, 1932.

HE PHYSICAL BASIS OF EDUCATION.

the last meeting of the Medical Officers of ls Association a discussion took place on cal education in schools, which is reported r columns this week. The debate was prac- nd timely. For it is held by those who have ht about the matter in its many aspects— o every member of the medical profession ubject appeals from one angle or another— case has been made out for recognising that tion, private and national, should take a frank account of physical and physiological derations. This was the thesis of an address tly delivered before the North of England ation Conference in Nottingham by Dr. R. H. LEY, a senior medical officer of the Board of ation, who showed that during the last 25 the term "physical basis of education" has ved a huge extension of meaning. By the close e last century some public appreciation had ed that it was largely futile, and might even human, to impose systematic education on ren suffering from such disabilities as hunger, defective eyesight, adenoid overgrowths and l infections, or physical exhaustion from oyment out of school time. Such children provide a physical basis of a most unsatis- ry kind for education, and the prevention treatment of obvious and gross defects have the object of strenuous work over the period tioned—work which has been rewarded by tantial successes, as the annual evidence of ical officers of health and summarising reports e Board of Education have been able to prove, detailed figures in support of optimistic ions. The risk is that we should be too readily ent with happy achievement and be slow to eive that medical inspection must now mean eat deal more than the detection and treatment nanifest physical disabilities. While it is true t the majority of children in the course of lical inspection can be passed on for treatment h little or no comment, there are many others re inspection in the school is the beginning y of our medical responsibility towards them. ing eyesight as an example; we may quote CROWLEY. He says: "We must no longer be tent with finding out by somewhat rough and dy means what defect of eyesight a child may e and then send him to the oculist for treatment. is is analogous to what we used to do with the cripple child, and to what we still do in a large measure with the child with heart disease, though our practice in this respect shows we are learning the lesson the cripple child has taught us. More careful inspection of the visual capacity of the young child is the necessary precursor to any more effective prevention of defective eyesight, and to understanding of healthy vision." Now the understanding of healthy vision is linked up not only with the physiology of the child, but with the academic curriculum which he undergoes, and his material environment, and similarly we have come to perceive that the physical basis of education has always these large implications.

The discussion before the Medical Officers of Schools Association and Dr. CROWLEY's address at Nottingham are both illuminated by a correspondence which has been running sporadically through the columns of the *Times* for the past three months. This correspondence started in a challenging speech made by Lord DAWSON at the opening, last October, of the new sanatorium at Epsom College, when he pointed out that the medical officers of schools, and doctors called in attendance upon schoolboys, might well make a study of the principles of physical education, their duties not being limited to the care of the sick. On this text medical officers of schools, headmasters, instructors of physical training, parents as represented by the Parents Association, the Schoolmasters Education Association, and other representative individuals and groups have been expressing many views, mostly concordant, and, when otherwise, supplying arguments in support of their words. From these letters one message emerges, which can be summarised in the phrase with which Mr. MORTIMER BOOTH, the physical instructor at Christ's Hospital, opened the debate before the Medical Officers of Schools Association, when he pointed out that the relation of the physical to the mental development of the boy must always be kept in mind. The Consultative Committee of the Board of Education have issued valuable reports on "The Primary School" and on "The Education of the Adolescent," which imply or indicate the need for basing the process of education from early years upwards upon a physiological basis. That we have been getting nearer to this attitude for the last 50 years is sure, and as a practical development Dr. CROWLEY now makes the suggestion that special educational methods should be adopted for children between the ages of 7 and 11, believing that the characteristics of this age-group have a particular significance, it being a period of comparative stability, of resistance to unfavourable conditions, and of consolidation of muscles and nerve connexions. This is a period in the child's life which precedes the time when physical education usually becomes part of educational routine—definitely it is a period anterior to public school life; it is therefore useful to be reminded that "adolescence has its roots as well as its fruits."

To provide a physical basis for education is not

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[1] THE LANCET, 1931, ii, 807.

only to see that the calls for adequate food, proper ventilation, and due opportunities for exercise are well met. It is to see that throughout the education period there is an environment provided which will give physical education its proper chance, so that, in reciprocity, the educational curriculum may yield good results. A public sentiment is needed that good physical conditions are not so much a basis upon which education should be founded as a natural concomitant with which education must proceed. The recent letters in the *Times*, and various articles and reports which form stock reading in our columns, show that to secure this harmonious situation certain differences of opinion have to be smoothed out, but the process should not be hard. There are at the present moment points at issue between persons who have a right to consider themselves and to be considered of equal authority. Drill upon the Army pattern is spoken highly of, on one hand, as the kindergarten of physical organisation, and, on the other, is stigmatised as dull drudgery. Mr. JACKS, the headmaster of Mill Hill School, whose opinion carries weight in all educational circles, considers that, while a department should be created for the provision of adequate physical instructors, the school doctor, though an essential partner, should not be in charge of the department; this is a view running counter to that expressed by Dr. MURRAY LEVICK, who is an equally experienced counsellor. In the shaping of sanitary environment the medical officer of the school would naturally advise the authorities concerning heating and ventilation of premises, while his estimates of the quality of the children's food and the duration and pattern of their hours of study should be taken into account. In the shaping of physical education his position as an essential partner with the instructor might be easy to define; but it is hard to allot him a more definite position than that of an intelligent friend, when it comes to the arrangement with housemasters and headmasters of the details of housekeeping or the time-sheets of study. We are speaking here, of course, of the public schools, and there is nothing even in those strongholds of individualism that should not be capable of adjustment between persons having before them the common object of benefiting youth; in the State schools the same difficulties would not arise. Coöperative work between the school doctor and the physical instructor will be advanced by the better opportunities that are now being offered to the latter. The University of London has instituted a special diploma for physical education, which is open to candidates from approved centres, and the possession of the diploma will give the physical instructor a proper academic position on the staff of his institution. At the same time the Trustees of the Carnegie United Kingdom Trust have discussed the situation with representatives of local educational bodies and with the Board of Education and the resulting developments at Leeds are full of promise. From all of which it is to be seen that the need for a physical basis in our educational organisation is now not only admitted but being met along many practical lines.

THE SURGICAL REVOLUTION.

SURGEONS of long experience, when they contemplate the methods which were in vogue during the early years of their career, cannot fail to be impressed with the complete change in the outlook for many patients who must of necessity submit to an operation. Prostatectomy was at one time an extremely hazardous procedure; cholecystectomy was a dangerous undertaking, gastrectomy exacted a heavy toll; whilst thyroidectomy for exophthalmic goitre was so full of risk that it practically had no place in surgery. With respect to all these operations the prognosis has entirely altered, and it is instructive to ponder the factors which have brought about such astonishing advances. Refinement in technique has no doubt played its part, but modern surgeons would hardly claim to be better craftsmen than such masters as BILLROTH, DOYEN, or HORSLEY. It is likely that the greatest factor is the change in our mental attitude towards operation—notably a realisation that mechanical factors do not always play a major part, and often a very small part, in the restoration of the patient to health. Anatomy is as essential as ever, but physiology and the reaction of vital processes to altered mechanical relations have become recognised as of supreme import. Gastro-jejunostomy, for example, is more than a drainage operation, and the retention of urine due to an enlarged prostate has far more momentous effects upon kidney function than the mere mechanical distension of the renal pelvis. The study of the alteration of function of vital organs, the demonstration of the great reserve strength they possess, and the development of means of restoring their activity have placed in the surgeon's hands precautionary measures of immeasurable value. There has grown up a system of treatment before and after operation which is based upon solid foundations.

The extent to which modern surgical practice has been influenced by the development of our knowledge of physiology and pathology is made clear in the comprehensive series of articles by Dr. R. A. CUTTING on the principles of pre-operative and post-operative treatment which have been appearing during 1931 in the *American Journal of Surgery*. The format and double pagination of these articles, of which the last was published in the December issue of the journal, show that they are designed to form a book, and the volume will be a welcome addition to surgical literature. The last section of the work contains chapters on extensive superficial burns, on acute traumatic cranio-cerebral injuries, and on intestinal obstruction. In connexion with severe burns emphasis is laid on need for treatment of shock by morphine in large dosage, by the maintenance of heat, and by the promotion of quiet and rest. The local trauma is relatively unimportant, as far as immediate treatment is concerned, since toxic absorption does not occur for several hours. For extensive superficial burns tannic acid is recommended to the exclusion of any other local application. Its advantages in preventing the develop-it of toxæmia are stressed, but Dr. Cutting s not pretend that the coagulation of toxins be relied on to make systemic treatment ecessary. Blood transfusion, the administra- of saline solution in large quantities (4000 5000 c.cm.), and of dextrose are called for in re cases, supplemented perhaps by such iation as can be provided from an electric t tent, the use of which is recommended on r grounds. In the treatment of head injuries, ntion is drawn especially to the relative ortance of injuries to the contents of the skull the relative unimportance of skull fractures such. The interpretation of symptoms on the is of the pathological physiology is outlined, and non-surgical treatment of increased intra-nial pressure by dehydration and by lumbar cture is discussed as well as the indications for ecompression operation. The chapter on ileus ather disappointing, for Dr. Cutting can give little new information on the prophylactic curative treatment of this condition, or in the atment of the toxæmia of ileus, which is still ost entirely symptomatic. But he does show the patient's discomfort can be relieved, and kes a useful point in drawing attention to the ility of using epinephrin or ephedrine in con-ction with splanchnic or spinal analgesia for relief of ileus, since these drugs overcome the ect of the analgesia.[1]

No better instances of the advances in pre-erative and post-operative treatment could be en than the strides which have been made in surgery of diabetes and the hypertrophied ostate which Dr. Cutting dealt with in a previous ntribution to the series. Not many years ago e smallest surgical intervention in a diabetic s looked upon with horror and apprehension, about 50 per cent. of the patients died. Now e mortality is less than 5 per cent. This has en brought about by: (1) standardising the diet each particular patient; (2) giving an adequate se of insulin; (3) encouraging the patient take food almost up to the time of the operation, starvation leads to ketosis; (4) giving a pre-erative dose of dextrose together with a sufficient nount of insulin; (5) using minimal amounts of æsthetic, never chloroform, preferably nitrous xide, and best of all a local anæsthetic; (6) giving dextrose, after operation, all of which measures re the outcome of physiological experiment in nimals and chemical investigations of the blood man.

The patient with an enlarged prostate is lways in the later decades of life, and the evitable degenerations have occurred in his irculatory and other essential systems. Their ffect has been increased by urinary retention, with he toxæmia it produces. The remarkable reserve ower which the kidneys are known to possess nay be all but used up before the patient is aware hat anything is amiss, but the degree of danger an be estimated by means of two routine tests: 1) the power of concentrating urea in the urine, and (2) the level of urea in the blood. So far as the kidneys are concerned it is now known that if the pressure against which they have to secrete is gradually lowered, latent powers of recovery are allowed play, and renal function will return to normal or nearly normal level, often with surprising speed. This discovery formed the basis for the two-stage operation which has saved innumerable lives. The performance of a preliminary operation to gain this end, however, is now regarded as unnecessary by an increasing number of surgeons, for it has been proved that catheter drainage is as effective as a suprapubic opening in more than three-quarters of the cases. The problem of the damaged kidney has thus been largely solved. It is not so with some of the other disturbances, which may be present in patients with prostatic enlargement. Every effort should be made to estimate the condition of the cardiac muscle; for this, unfortunately, no very reliable test is as yet available. A hæmoglobin estimation should be carried out. The chronic interstitial nephritis from which all these patients suffer causes an anæmia which is the more serious inasmuch as the amount of hæmorrhage during the operation, and subsequently, cannot be foretold or certainly controlled. Enough has been said to show that slowly yet surely a revolution has been taking place in surgical outlook, surgical treatment, and surgical prognosis. This is true of every province of surgery. The cruel withholding of fluids after laparotomy, the painful, unnecessary, and harmful purging both before and after operation, the unkindly restraint, are things of the past. The sufferer from an abdominal complaint necessitating a surgical operation may well be thankful he was not born 50 years before.

THE LICENSING COMMISSION.

The Report of the Royal Commission on Licensing is an interesting and a surprising document. The surprising feature is the degree of unanimity achieved by a body selected to include extremes of temperance and trade opinion in addition to other members who might have been expected to hold preconceived ideas on the subject. The result is a tribute not only to the able chairmanship of Lord Amulree, but also to the strength of the evidence which brought 16 out of 19 members into the fold of the Majority Report. Of the three Minority Reports, one, that of Mrs. Simon, is *in substantial agreement* with most of the conclusions of the majority, but would go more quickly in the direction of the public ownership to which the Majority Report quite definitely points. The other two Minority Reports are those of one of the brewing trade representatives and of the retailers' representative respectively. Another representative of the liquor trade, also a brewer, signs the Majority Report with certain reservations.

When the Commission was appointed in 1929 it was suggested, not in pro-trade quarters alone, that the Labour Government had successfully shelved the question because so diverse a team would never produce any effective result. Events have certainly saved the Labour Government the trouble of dealing with the Report which, however, *completely* belies those *anticipations*. The Report is likely to form the basis of legislation in the future to a greater or less extent according to the character of the Government which eventually tackles the problem. It is certainly unlikely that the present Government will find time for legislation on the lines of the Report.

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[1] Ochsner, A., Gage, I. M., and Cutting, R. A.: Jour. Amer. Med. Assoc., 1928, xc., 1847.

After giving full weight to the great general improvement in sobriety which has taken place during the present century, and particularly since the war, the Report states that excessive drinking still persists in large measure, and that apart from actual intemperance, expenditure on intoxicants still reaches a definitely uneconomic figure. Some startling figures are mentioned in support of the latter contention. The annual expenditure on drink in an industrial metropolitan borough was stated in evidence to be reliably estimated at £1,200,000 or an amount of 16*s.* per week for each family, and £17 per annum for every adult over 20. *This in a borough where the average employed* wage is put at approximately £2 5*s.* a week. The problem, then, is still substantial, and in the forefront of the proposals for improvement the Report places "the provision of machinery for achieving much more rapid reduction of licences—"more rapid, that is, than has been achieved by the 1904 Act. This is to be brought about by, inter *alia*, an increase of the levy up to a maximum of three times the existing rate. It is satisfactory to observe that the Report particularly stresses the need for "more effective encouragement and more rapid development of the policy of public-house improvement, and in particular of the conception of the public-house as a place of general refreshment *rather than as a place primarily devoted to* the sale of alcohol." This is a policy which will be warmly approved by public opinion generally, and it is of great interest to note that, after fully reviewing the relative advantages and disadvantages of private enterprise and public ownership more particularly in relation to the policy above defined, the Report comes down on the side of public ownership, though it is on this point that certain of its signatories append reservations. The line of agreement by which the majority arrive at their conclusion is illustrated by the following quotation:—

> "While recognising fully the efforts of the best elements in the Trade to improve their houses in accordance with modern ideas and tendencies . . . it is impossible to get away from the fact that the ruling motive of the brewer, who is the owner of the vast majority of existing publichouses, must necessarily be *promotion of the sale of the goods* in which he is chiefly interested; and it would be unnatural to expect the Trade as a whole, left to itself, to lead public opinion in the matter of the conversion of the publichouse into a place where the sale of intoxicants is to take a secondary position."

The financial circumstances of the time are held to preclude universal State acquisition of the liquor trade at present, but extension of public ownership is recommended though not on precisely the lines existing in the Carlisle area. The suggestion is probably wise that direct State management should be modified in the direction of management by a body established as nearly as possible on business lines but with due provision for the *element of social welfare.* Mrs. SIMON's Minority Report is of special interest in this connexion presenting, as it does, a comprehensive scheme for public ownership which appears to surmount the two objections most commonly urged against that course, viz., (1) the burden on the exchequer of cash payments or guarantees of vast sums, and (2) direct State management of the liquor business The London Passenger Transport Bill is the model on which the scheme is based, payment for the interests taken over to be made in the form of "Licensing Stock." The essential feature of the scheme, says Mrs. SIMON, "is the transfer of the control of the sale of alcoholic liquor from the private interests in which it is at present vested to a Statutory Body constituted for the purpose by Parliament but not in itself a State Department."

Another matter of general interest dealt with in the Majority Report is that of permitted hours of sale. Restriction in hours of sale was first introduced *as a war measure, and after* recording the conviction that restriction has been of great value in promoting sobriety the Report states the *considered opinion that* the present scheme is acceptable to a vast section of the public, including public-house clients, and is becoming more and not less so. This represents a significant change in public opinion which is likely to support the proposal of the Report that the general closing hour should be 10 P.M., subject *to* the provision of special facilities in restaurants and hotels, especially in London theatre-land. The scheme proposed to meet such cases appears both reasonable and workable. Regarding clubs, the Report favours a considerable tightening up of the present law, *and, if adopted, the recommendations* will do much to remedy an admitted abuse. It is regarded as indispensable that powers of entry into registered clubs should be conferred on the police, and that among *the* essential conditions precedent to registration is to be the absence of any "tie." The Report suggests that well-conducted clubs should not resent a control which without embarrassing them will assist in eliminating undesirable clubs The tied house system as a whole comes in fo severe criticism, and modifications of the law ar suggested in the direction of improving the positio *of the licensee vis-à-vis the owner-brewer.* Thes *recommendations, if* carried into effect, should d much to secure improved service for the public Few will be found to quarrel with the desir expressed in the Report for more definite encou agement of specific *education on the* subject alcohol, but the *present time is hardly* propitiou for the execution of the only one of the main recom mendations which has *not, so far,* been referred to— viz., the proposal for the establishment of National Licensing Commission. Nevertheless, th case for this proposal, like all the other recommen dations in the Report, is *moderately* set out an so impartially *argued that* it should receive ver careful *consideration.* The Report will be welcomed by all who are genuinely seeking an advance in th highly important matter of temperance reform.

ANNOTATIONS

ERRORS IN CERTIFICATION.

three cases, summarised in another column, the t Sussex Insurance Committee has recently found titioners at fault for issuing certificates con- ing false and misleading statements. In each he had given a series of monthly certificates, on special forms provided for the purpose, stating t he had examined the patient on a particular date ugh he had in fact not seen the patient profession- during the period covered by the certificates. it happened, no great harm was done. In each e the patient was suffering from chronic disease ich caused incapacity for work during the period. each case the practitioner was justified in issuing ecial monthly certificates. In no case was the proved society prejudiced by the payment of nefit following upon the certification of continuing apacity. In no case was the practitioner asked visit the patient. In no case was treatment quired to alleviate pain or to prevent suffering. In no se was there much, if any, prospect of active treat- ent arresting disease. Fortunately it is clear that ese three cases were not the most serious imaginable. ut it is equally clear that any inaccurate certification serious enough at a time when supervision over the istribution of millions of pounds in sickness and isablement benefit should more than ever be unctiliously exercised. These great sums are dispersed rgely upon the evidence of insurance practitioners' ertificates.

National health insurance certification is neither a rivial formality nor a merely clerical matter. The ood-natured desire to avoid giving trouble looks udicrously inadequate if, when the facts almost nevitably come to light, it is the only available xplanation for the untrue statement that a doctor has examined a patient. If insurance work is under- aken, the game must be played according to the rules. ne rule requires a periodical certificate to be given on a special form; the form incorporates a declaration that the certifying doctor has examined the patient. At present our fellow-citizens are prepared to accept a medical practitioner's signature as a guarantee that the certified statements may be relied upon as truthful. While it is easy to be pontifical at the expense of hard-worked panel doctors, we ask them not to let these cases recur. No special "Warning Notice" is needed by way of reminder that, if our guarantees cease to be worth their face value, the consequences must be grave both for the individual and for the whole profession.

PANCREATIC TUMOURS AND HYPOGLYCÆMIA

AN apparently normal pancreas is a common nough finding at autopsy in fatal cases of diabetes, with the ordinary histological methods usually ployed a microscopical examination may show no signs of disease. In fact, there may be less structural change to account for prolonged and serious symptoms in diabetes than in any other chronic disease. In the current number of the *American Journal of Pathology* (1931, vii., 723) Dr. Margaret G. Smith and Dr. Marshall G. Seibel suggest that anatomical evidence of the association of the pancreas with carbohydrate metabolism may be forthcoming more frequently than is usually supposed. In 1927 R. M. Wilder and his collaborators published a remarkable case of carcinoma of the islands of the pancreas associated with hyperinsulism and hypoglycæmia. The patient required hourly doses of glucose to prevent hypoglycæmic convulsions, and when the necessary sugar was delayed the blood-sugar fell below 0·03 per cent. Only a few other examples of island tumours have been reported in the literature, but Dr. Smith and Dr. Seibel suggest that they are not really uncommon. They themselves describe five cases. In four of them the tumours were quite small, 1 cm. or less in diameter, and might well have been overlooked. The fifth case was apparently diagnosed in life; it was at any rate removed by operation from a young boy who had shown characteristic symptoms of hypoglycæmia for eighteen months. This tumour was situated in the body of the pancreas and measured 2 by 1·5 cm. Of the other cases, one showed signs of hypoglycæmia and the blood-sugar estimated just before death was 58 mg. per 100 c.cm.; another, who died from pulmonary embolism following lobar pneumonia, behaved like a total diabetic during her last illness. The remaining two presented no very definite signs of a pancreatic lesion during life. Some of the previously recorded cases have been described as low-grade carcinomata, and Wilder's tumour had disseminated to the liver and lymph nodes; but Dr. Smith and Dr. Seibel regard their tumours as adenomata, and from the descriptions given none of them appears to show any evidence of malignancy. There seems no doubt that they are composed of island cells and consist largely of abnormal beta cells, but it is interesting to note that of two cases which presented tumours identical macroscopically and microscopically, one showed signs of hypoglycæmia, while the other gave no evidence at all of disordered metabolism. Whether it secretes insulin or not the tumour appears to have no stimulating influence on the normal island cells in the rest of the gland; these, anatomically, are quite unaltered, though clinical studies of the sugar tolerance suggest that in some cases their activity may be depressed.

BRITISH SPAS AND SEASIDE RESORTS.

THE primary purpose for which the Medical Directory is consulted is reference to personnel—and the very bulk of the sections devoted to British doctors is liable to obscure the other matter. One of the sections, which contains a medical report on British spas and seaside resorts, by Dr. R. Fortescue Fox, has been reprinted as a pamphlet,[1] in which convenient form it reveals a message peculiarly appropriate to the present times. Excluding the New Zealand spas—which in a future edition might well be supplemented by spas in the other Dominions or omitted—some 130 spas and health resorts are dealt with. These are indexed alphabetically from Aberdovey to Yarmouth, but in the text are classified into the following subsections: The Principal British Spas (11); Other Inland Health Resorts (26); Health Resorts of the British Coasts: North-Western Group (23); South-Western Group (23); Southern Group (13); South-Eastern Group (13); Eastern Group (20). The information given includes some account of the situation and climate, season, natural waters (where these exist), sea-bathing in coastal resorts, medical indications, and brief notes on the accommodation available, with references to the advertisement pages have certainly saved the Labour Government the trouble of dealing with the Report which, however, completely belies those anticipations. The Report is likely to form the basis of legislation in the future to a greater or less extent according to the character of the Government which eventually tackles the problem. It is certainly unlikely that the present Government will find time for legislation on the lines of the Report.

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[1] London: J. and A. Churchill 1931. Pp. 95. 1s.

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e it is difficult to express dyspnœa quantitatively. 43 patients studied two were worse, 12 noted no erence, while 14 stated that the same exertion duced less discomfort, and 15 were cured to the ent that the ordinary exertions of everyday life sed no respiratory embarrassment. An attempt s made, in eight patients, to control these subjective ults by estimation of the vital capacity and the tilation index. Of the seven who expressed themves as better or relieved all showed a fall in the tilation index, whereas in the case of the one tient who said he was more easily dyspnœic after king digitalis the ventilation index was markedly reased. Thus from these investigations it seems at the indications for digitalis therapy in heart ease must be widened, and that many patients th troublesome symptoms might be relieved by its nely administration.

THE NON-TUBERCULOUS SILICOTIC COAL-MINER.

THE incidence of pulmonary tuberculosis among al-miners is becoming a matter of considerable nportance. For years those who have been interested n industrial pneumokoniosis have assumed that oal-miners do not suffer from any pulmonary disbility as the result of their occupation. It is true hat there is a high incidence of bronchitis among oal-miners in the later decades of life, but tuberculosis, which is recognised all the world over as the utstanding risk of those who work in dusty occupations, does not appear to occur more frequently among colliers than among other members of the population, but rather the reverse. The dust which is particularly associated with phthisis is silica, usually in the crystalline form, and it has been assumed either that coal-miners are not exposed to siliceous dusts, or, if they are, that damage to the lungs does not follow because of the protective action of the associated coal dust. Of recent years, however, it has been shown by S. Lyle Cummins and A. F. Sladden that silicosis actually does occur among men occupied in certain types of coal-mining. Why, then, is phthisis not more common among them? Silica, of course, is only one of the factors which may influence adversely the progress of a tuberculous infection; it does not necessarily constitute the whole of the story. Physical fitness and adequate nutrition may presumably be expected to act potently on the defensive side, and may do much to counterbalance the influence of the silica. Coal-mining is an arduous occupation and the physically unfit are weeded out at an early stage; while except during the recent years of depression the economic condition of the miner when in work, with all that that entails, has been above the average. But physical fitness and a high economic standard have not prevented miner's phthisis in South Africa and elsewhere, and the question why coal-miners are exempt still remains to e answered. In point of fact there is evidence that n certain coal-fields, at any rate, this freedom from tuberculosis does not obtain; and it is possible that the data upon which the statistics relating to the industry as a whole have been based have been accepted without sufficient scrutiny. The whole subject bristles with difficulties and is in urgent need of reconsideration. In a paper in a recent number of the *Journal of Hygiene*, Prof. S. Lyle Cummins and Dr. C. Weatherall[1] suggest that the coal-miner may be protected to some extent from pulmonary tuberculosis by the adsorptive power of the coal dust with which his lung is saturated. It has been demonstrated that finely divided charcoal has the power in vitro of adsorbing from tuberculin the constituent on which its activity depends. Following up this suggestion the authors have performed the following ingenious experiments. Dilute solutions of old tuberculin were saturated with powdered anthracite coal for a period of some hours. They were then centrifuged and the clear fluid was injected intradermally into adult tuberculous patients. From the difference in size of the resulting "wheals" compared with those produced by similar quantities of non-adsorbed tuberculin it was evident that the tuberculin lost a considerable degree of potency after exposure to the coal dust. In slightly alkaline solutions adsorption was considerably increased, for the treated tuberculin failed to produce wheals in 20 cases, whereas positive reactions were obtained in 18 out of 20 controls.

The question then arose whether the adsorptive power of coal dust in the lungs is the same as in the in vitro conditions, or whether exposure to the body fluids diminishes it. Coal dust was therefore suspended in fresh human blood-serum for 3½ hours. It was then centrifuged, thoroughly washed, and resuspended in the alkaline solution and used for inactivation experiments. Tuberculin adsorbed by this serum-treated coal appeared to be somewhat less active than the untreated material, but the results are nothing like as clean-cut as in the earlier experiments. It is, of course, a big assumption to suggest that the reactions occurring in these experiments are comparable with those actually taking place in the infected lung, and that carbon in the tissues will inactivate the products of the tubercle bacillus as easily as it does in the test-tube. In what must after all be regarded as a crude attempt to imitate the state of coal when actually in the lung, the authors have shown that the dust loses a great part of its absorbing power. It may well be that in the tissues it loses it altogether. As the authors say, the question can only be answered by experiments on the anthracotic animal, and in the meantime we are left with the paradox of the non-tuberculous silicotic coal-miner.

ACCIDENTS AND SICKNESS.

APPRECIATION of this interaction between environment and living beings is changing the outlook of accident prevention from the old-time concentration upon mechanical guards towards a regard for the human factor with its special sense reactions. These vary with ill-being and well-being, with the irritation bred of fatigue and the joy of healthy activity. The engineer is coming to see that accidents, far from being merely mechanical mischances, represent pathological reactions to environment; while their study is more and more laying bare to most physicians that the origin of other great causes of pathological occurrences lies as much in the environment of life as in the innate make-up of their patients. The study of "accidental occurrences" has as much to teach the physician as the engineer. The last issue of the Industrial Safety Survey,[1] published bimonthly by the International Labour Office, contains an account of the International Congress held last May at the Industrial Safety Museum in London. At this where further details are supplied by the hoteliers. This compendium of useful information is made the more valuable by the concise introductory notes, supplied by the author from his rich experience, on the choice of medicinal waters and spas, and on the general and specific indications for the selection of any spa. Dr. Fox points out that the principal considerations that may influence the practitioner in selecting a resort for a patient may be the eliminating quality of its waters, or their other qualities, the methods of external or thermal treatment provided, and the climate, amenities, and medical service. Sometimes one, sometimes another of these points predominates. At this season it is well to be reminded (page 5) that for chilly persons a course of thermal baths may have much the same stimulating effect as a change of climate, and may enable delicate workers to get comfortably through the winter. Dr. Fox adds, however, that if success is to be achieved all exposure to cold during treatment should be avoided; and that not only the bath establishments, but the hotel or dwelling-house where the "chilly person" is accommodated must be artificially warmed to summer temperature. This warning is still unheeded in too many places in this country, but an increasing number of hotels are now providing such amenities as central heating, lifts, and constant hot water in the bedrooms. The reward of installing these conveniences should be to attract many more people to follow the advice given on the cover of this pamphlet—that is, to seek the soft Atlantic airs in spring and winter, the strong Eastern airs in summer and autumn, and the sunny South coast in all seasons.

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[1] Cummins, S. Lyle, and Weatherall, C.: Adsorption of Tuberculin by Coal Dust, Journal of Hygiene, 1931, xxxi., 464.

[1] Industrial Safety Survey, vol. vii., November–December, 1931. International Labour Office, Geneva.

IS CANCER PREVENTABLE?

A FEW years ago we commented in these columns [1] on a paper by Dr. A. L. Wolbarst, of New York, in which he claimed to have proved that cancer of the penis never occurs in persons who have been circumcised in infancy. We then expressed a lingering doubt whether the statistical data on which the argument was based were sufficiently reliable. Since then Dr. M. Sorsby,[2] in his study on the incidence of cancer among Jews, has shown that Jews and Mohammedans enjoy complete freedom from cancer of the penis, and in this issue Dr. Wolbarst contributes further evidence which establishes this fact beyond doubt. He shows, moreover, that this freedom from cancer of the penis is due to the greater cleanliness made possible by circumcision. Circumcision is, therefore, to be recommended from many points of view as a measure of general hygiene. In civilised countries cancer of the penis is rare, while in the native races of the East who do not practise circumcision it is relatively common. In England and Wales, with an annual death-rate from cancer of about 26,000 men, only about 150, or 0·6 per cent., die from cancer of the penis. This difference is again due to greater cleanliness. Numerically, therefore, the general adoption of circumcision in this country would not materially diminish the general mortality from cancer. The great significance of these findings seems to us to lie rather in the demonstration of the fact that cancer is a preventable disease. For penile cancer the means of prevention are simple—namely, hygienic care by circumcision. But if hygienic care can prevent cancer in one organ why should it not do so also in other organs? For Jewish women observing the Mosaic code Dr. Sorsby demonstrat a lower incidence of cancer of the uterus as compa with Gentiles, and ascribed it to the insistence of t Mosaic code on sexual hygiene. Some years a Dr. T. H. C. Stevenson [3] showed that cancer of t upper alimentary tract, from the lips to and includi the stomach, is twice as common in the lowest soci classes as in the higher social classes, but no differen whatever was found between the two classes for t incidence of cancer in the lower alimentary trac from the stomach downwards. Quite recently D W. Cramer [4] has demonstrated from a compari of international statistics that cancer of the stoma is more than twice as frequent in a number of Cent European countries as it is in this country. Apparent there are groups of populations in Europe in which t incidence from cancer of the stomach is so high t of three people who die from cancer two die fr cancer of the stomach, while in this country on average out of four people who die from can only one dies from gastric cancer. Dr. Cramer arg from this that in those groups where the incide from gastric cancer is high, a large proportion of cases must be due to extraneous factors which avoidable. Evidence is therefore gradually accu lating which indicates that for a number of org cancer is, within limits, a disease which can prevented by paying attention to the general hyg of each particular organ throughout life.

DIGITALIS IN HEART DISEASE.

SINCE the nature of auricular fibrillation was ur stood it has been generally recognised that it this type of heart failure that digitalis has its gre effect. Some observers even consider that condition is the only true indication for dig therapy. Most cardiologists, however, are a that its administration is useful in congestive failure with normal rhythm, sometimes know right ventricular failure, although admitting th does not produce such consistently striking resu in auricular fibrillation. For some time now thes conditions have been generally regarded as the two types of heart disease in which the use of dig is desirable. It was therefore somewhat surprisi find White stating in his recent monograph [5] th considered efficient digitalisation and its mainter together with rest and restricted activity, o greatest value in abolishing attacks of cardiac as or in reducing their frequency. Harrison, Cal and Turley [6] have now investigated the effe digitalis in ambulatory patients, with little œdema, who suffered from attacks of cardiac as or from dyspnœa on slight exertion—so-calle ventricular failure. They found that in those paroxysmal nocturnal dyspnœa (cardiac as the administration of digitalis had a notably ficial effect. Of 19 treated, one was worse were much improved, while in the remaining 1 attacks were completely abolished, several having now been free from attacks for over two Thus this investigation fully corroborates W statement. As regards the patients with dyspn exertion the results of digitalis therapy were less remarkable, and were more difficult to quate treatment could be given; five showed a ial response at the clinic but have required almost inuous treatment with cortical hormone since harge; three showed an excellent response at the ic but did not continue treatment at home and l in crisis; nine did well at the clinic and have ained well since, with occasional courses of treatnt. The course of the disease is necessarily influed by the degree of the suprarenal damage, but s clearly established that the preparation is useful, l it is satisfactory to know that efforts are being de to prepare an active standardised preparation a commercial scale. Meanwhile it may be noted t S. W. Britton and his associates[2] at the Univery of Virginia, have found that in animals whose rarenal glands have been removed the extract is ective when given by mouth in three to five times intraperitoneal dosage. He thinks that with proved methods of preparation it is possible that al treatment may be of distinct service, and he edicts that suprarenal cortex will soon find wide plication in the medical field.

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[1] THE LANCET, 1927, i., 39.

[2] Cancer and Race. London. 1931; see THE LANCET, 1931, i., 1198.

[3] Registrar General's Decennial Supplement Engla Wales, 1921. London. 1927. Part II. Pp. 27.

[4] Zeit. f. Krebsforschung, 1931, xxxiv., 531.

[5] White, P. D.: Heart Disease, New York, 1931, p.

[6] Harrison, T. R., Calhoun, J. A., and Turley, F. C. Int. Med., Dec., 1931, p. 1203.

POLIOMYELITIS IN THE UNITED STATES.

THE serious epidemic of poliomyelitis in the nited States of America last year is reviewed in e November issue of the Statistical Bulletin of the etropolitan Life Insurance Company. Up to ct. 17th a total of 13,091 cases had been registered 19 States—a sickness-rate of 21 per hundred ousand of population. The highest rates were in onnecticut State 78·9, and Brooklyn City 94·5. It interesting to compare this epidemic with that of 916, when the total sickness-rate was 53·3, Brooklyn ity again leading with 224 per hundred thousand. he disease last year was therefore much less extenive than in 1916, and it was also much less virulent, he case-mortality being 10·3 per cent. as compared ith 26·2. The death-rate among children was no ess than 81 per cent. lower than that of 1916, and he incidence of crippling also was much less. A hart in the report shows the death-rate that might have been expected last year if calculated on the basis of policy-holders affected in 1916. The discrepancy between this curve and that of the actual death-rate is striking, but the two curves show a certain similarity in the way they rise from month to month. A careful comparative epidemiological study of these two outbreaks might provide valuable data.

BARBITURATES AS ANALGESICS IN LABOUR

THE latest candidates for use as analgesics in labour are the barbiturates, and the latest method of employing one of them, nembutal, is described by Dr. J. V. O'Sullivan and Dr. W. W. Craner on p. 119 of this issue. In the scheme they recommend barbiturate is combined with chloral, both drugs eing given by mouth, and it is of course a great vantage if the desired effect can be achieved by simple oral administration. Intravenous injection is bound to carry some added risk, though this may be very slight, and instances of thrombosis have been reported. Intravenous injection, moreover, could scarcely be entrusted to the midwife, whereas the authors of this new variation in the use of sedatives for labour think that their method may safely be conducted by her. In this we are not prepared at present to follow them, nor do we hold that the comparatively small number of cases in which the treatment has been tried provides a reliable basis for regarding it as free from all danger. Both the drugs used are potent, and it is plain that scrupulous care is necessary both in dosage and in determining the time for giving the additional doses. Nevertheless the results in the 60 cases on which the paper is based are excellent, and it is quite obvious that this use of nembutal and chloral in combination deserves an extended trial. If further experience substantiates the opinions of O'Sullivan and Craner we shall have an easily administered and very effective method which provides painless labour for a large proportion of cases with no untoward effect on mother or child. A recent paper[1] on pernocton in obstetrics supports the claims which German authorities have made for the use of this barbiturate in labour. Here, however, only the intravenous administration, supplemented by intramuscular injections, is employed, and the procedure comes therefore into rather a different category. Hitherto the chief objection to barbiturates in labour has been the frequency and sometimes the violence of the restlessness which may develop. In only two out of the 60 cases at the London Hospital was this symptom severe after the oral use of nembutal and chloral.

MEDICAL WORK IN BRITISH COLONIES.

THE Bureau of Hygiene and Tropical Diseases have issued, as a supplement to the *Tropical Diseases Bulletin* for December, 1931, a summary of the medical and sanitary reports furnished by British colonies, protectorates, and dependencies for the year 1929. This supplement, which will appear annually, is an innovation. The Colonial Office has hitherto published summaries of these reports, for official use only, under the title of Medical Research in the Colonies, Protectorates, and Mandated Territories. In this form appeared the reports for 1926, 1927, and 1928, edited by Dr. H. H. Scott as secretary of the Colonial Medical Research Committee. This committee no longer exists, and Dr. Scott has joined the staff of the Bureau. The wider publication of these summaries will be to the advantage of all concerned in the administration and growth of tropical medicine. Especially important matters of research are dealt with more fully in the *Tropical Diseases Bulletin* or the *Bulletin of Hygiene*. The supplement consists of a true record of hard routine work performed and a statement of the directions in which research is being carried out. Little attempt is made at comment, but the reader with knowledge and insight will grasp the continuous creative effort underlying these apparently dissociated accounts. For him this unassuming pamphlet describes one of the great endeavours of the human race. It is a pity that an account of public health work in the Anglo-Egyptian Sudan is not included for the sake of completeness, despite the fact that the Sudan does not fall politically within the scope of the collection.

WE regret to learn of the death on Wednesday last of Dr. James Calvert, consulting physician to St. Bartholomew's Hospital.

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[2] Britton, S. W., Flippin, J. C., and Silvette, H.: Amer. Jour. Physiol., December, 1931, p. 44; Quoted in Jour. Amer. Med. Assoc., Jan. 2nd, p. 52.

[1] Med. Jour. Australia, Nov. 21st, 1931, p. 650.

A HOSPITAL COLLECTORS' CLUB.—The Manchester Jewish Hospital has a club of young collectors of both sexes with a membership of 300 who, from first to last, have brought in some £12,000.

congress experts met to discuss how best to present the principles of industrial health and the methods for securing it, including the study of fatigue and its prevention, the influence of heat, of humidity, and of noise, and accidents caused by falls. Among official reports quoted upon work done and recent progress attained much space is deservedly devoted to the activities of the British factory inspectors. One notable article of special interest is entitled "Forty years of the Riving Knife," which knife is used with circular saws. The reader of this survey must be impressed with the more or less extensive campaign now conducted against factory accidents, as contrasted with the lack of attention paid to the personal factor in mining accidents, which are at least ten times as frequent; in accidents to seamen; in accidents occurring in quarries, in ship-building, in construction work, or among railway men. All of these have far higher rates and provide objectives urgently calling for more intensive attack.

INTELLIGENCE AND DISEASE.

DOES illness *in general* retard intellectual development or is it only certain diseases that have this effect, and what are they? Answers to these questions are sought in a report by Dr. Shepherd Dawson and Mr. J. C. M. Conn issued this week.[1] Binet intelligence tests, of which a short but admirable account is given, were applied to over a thousand children in the Royal Hospital for Sick Children, Glasgow. These children were drawn mainly from the lower end of the social scale and, judging by housing, occupation of parents, intelligence, or stature, they were below the general Glasgow average. It might be objected that a sick child is not a suitable subject for mental examination. This the authors do not believe, except, of course, when the patient is dangerously ill or delirious. The figures they produce certainly support them, for in intelligent quotient (or ratio, as the authors prefer to call it) the patients did not differ significantly from their healthy brothers and sisters. A comparison of the results obtained in acute, not-acute, and chronic patients, both among themselves and between them and their healthy brothers and sisters, with the results of tests made during and after illness, gives rise to the conclusion that, in general, sickness does not appear to retard mental development. In the acute stages of illness there is even a slight improvement in mental efficiency which, the authors suggest, may be due to a temporary increase in irritability of the central nervous system. There is no indication that chronic illness seriously retards the development of intelligence, as measured by these tests. On the other hand, although disease in general does not appear to produce any distinct effect on intelligence, there are some diseases in which changes can be clearly recognised. These were found to be mainly diseases of the ductless glands and of the brain. There was clear evidence of intellectual deterioration in most of the cases of post-encephalitis lethargica, though no statistically significant difference between those patients with the parkinsonian syndrome and those without it was apparent. The epileptic patients were on the whole of lower intelligence and when re-tested showed signs of deterioration. Eighteen cases of hysteria show a mean intelligence ratio only slightly below the average of the whole of the patients, while, contrary to beliefs sometimes advanced, there is no evidence th children suffering from chorea are drawn fro the more intelligent—the "highly strung, excitab nervous, bright, intelligent" type. There were l children with chorea and they proved to be neith brighter nor duller than the rest.

It has long been known that members of the upper social classes are on the whole taller than those of the lower classes. Even in the comparatively homogeneous social class here investigated this tendency is to be observed. When children of the same age are considered there is a tendency for the taller to be the more intelligent. This correlation, as the authors point out, raises some interesting questions. Are we to infer that superior intelligence is inherited with superior stature by certain stocks, or that superior stature in some way promotes the growth of superior intelligence, or that the more intelligent parents make better provision for the bodily growth of their children and that the cumulative effect of this is an increase in stature? It should be possible to test the last question by the examination of, say, a group of public school boys, where the "provision for bodily growth" would not differ appreciably.

SUPRARENAL CORTEX IN ADDISON'S DISEASE

THE paper from University College Hospital published on p. 125 of this issue will be valuable to all i this country who may wish to try treatment Addison's disease with suprarenal cortex. It is no nearly two years since W. W. Swingle and J. Pfiffner announced their success in preparing extract which would keep cats alive indefinite when the suprarenal glands were removed, and t latest report from them and their co-worker summarises the immediate results obtained in total of 20 human cases. In cats the dosage was 1 c.c of extract per day per kg. body-weight, and a corr sponding dose in man would be 60–90 c.cm. This cou not be provided from the limited supplies ava able for clinical use, but it must be remembered th in Addison's disease complete suprarenal insufficien is probably rare and substitution therapy has on to make up the difference between the output of t patient's own glands and his daily requirement. T largest single dose which has been given is 20 c.c intravenously, but 40 c.cm. has been given in one d in a crisis of the disease with no untoward effec For those patients who are so ill as to require co tinuous treatment 3 to 10 c.cm. has been the amou given daily. The immediate results are constant a striking. Improvement usually appears in 24- hours, and the maximal effect, as a rule, is not "over a period of from five to seven days af stopping treatment." Anorexia, nausea, vomitin and the distressing pain in the loins disappear a there is early increase in strength and enduran while decrease in pigmentation becomes appare within three or four days. Other benefits noted reappearance of appetite, gain in weight, return normal gastro-intestinal activity, and a sense of we being. When the patient is in a state of crisis shock at the beginning of treatment there is moderate increase of blood pressure, but little chan occurs when the initial condition is good. The resu in the 20 cases may be summarised as follows: case did not respond at all well to adequate tre ment and died; two were moribund and died befo ontreal. Out of several thousand deaths, there not a single case of penile cancer in a Jew. In large Jewish community of Palestine, Dr. H. sky, Acting Director of the Hadassah Medical nisation, reported [‖] that not a single case of le cancer was recorded in a Jew in a total of 21 new cases in the Skin and Venereal Clinic; case, however, was reported in a Christian Arab. rom these data it is evident that, while penile er may occur in an uncircumcised Jew, it does not r in Jews circumcised in infancy. The latter ervation has been made by competent observers, ong whom may be mentioned the following: J. Waring,[9] Da Costa,[10] Chetwood,[11] Watson and owsley and Kirwin,[15] Thomson [15] Eisendrath and Rolnick,[16] Legueu Michon,[39] and K. M. Walker.[41]

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[1] Intelligence and Disease. By Shepherd Dawson, M.A., D.Sc., assisted by J. C. M. Conn, M.A., 1931, M.R.C. Special Report Series No. 162. H.M. Stat. Office. Pp. 53. 1s.

[1] Rowntree, L. G., Greene, C. H., Ball, R. G., Swingle, W. and Pfiffner, J. J.: Jour. Amer. Med. Assoc., 1931, xcvii., 14

PENILE CANCER IN MUHAMMEDANS.

A high degree of immunity against penile cancer is o seen in Muhammedans, who, like the Jews, actice ritual circumcision. In India, Sutherland [17] orted 792 cancer cases, of which 72 were penile, occurring in Hindus (uncircumcised) and none in hammedans: while in a series of 64 cases seen in lcutta, and reported by Megaw [18] only two occurred Muhammedans.

Through personal correspondence I have been rtunate enough to obtain most valuable data ncerning penile cancer in Indian hospitals during e period 1925–1930. The figures are clearly shown the accompanying Table:—

Hospitals.	Total cancers in men.	Penile cancers.	Penile cancers in—		Percentage of Muhammedans in hospitals.
			Hindus.	Muhammedans.	
adras Presidency (a) and Madras City ..	5122	921	907	14	9·8
overnment of Bengal (b)..	1792	117	109	4	16·0
vil hospitals, Central Provinces (c) ..	460	113	109	2	21·8
vil hospitals, Assam (d) ..	318	49	44	4	37·13
Totals ..	7692	1200	1169	24	Average 21·19

(a) Personal communication, Surgeon-General's Office, Oct. 22nd, 1931.
(b) Personal communication, Surgeon-General's Office, July 23rd, 1931.
(c) Personal communication, Inspector-General's Office, June 30th, 1931.
(d) Personal communication, Inspector-General's Office, Sept. 18th, 1931.

If we combine these official figures with those of Sutherland and Megaw, we have a total of 8484 cancers in men. Of these, 1336 were penile cancers, of which 1303 occurred in Hindus (97·5 per cent.) and 26 in Muhammedans (2 per cent.), despite the fact that the average Muhammedan population in he hospitals reporting was 21·19 per cent. It is vious that if penile cancer occurred with equal quency in both these races, the number of cases reported in Muhammedans ought to approximate 254, instead of the 24 cases actually reported. (It may be noted, in passing, that the morbidity-rate for penile cancer in these Indian hospitals was 15·6 per cent., as compared with a rate of 2 to 3 per cent. in Europe and the United States. Vide infra.)

Sampoerno [19] investigated this subject among the Muhammedans of East Java, who also practice ritual circumcision. In a total of 78 cases of penile cancer, he reported seven in Javanese (presumably Muhammedans), three in Chinese, and one in a European, but he does not state definitely that the Javanese had been circumcised. It is possible, of course, as Kennaway points out,[20] that there may be a greater liability to penile cancer in Javanese than in other Muhammedan groups. As an instance of such racial peculiarity, Sampoerno asserts that cancer and ulcer of the stomach never occur among the Javanese.

Assuming that these seven Javanese were circumcised, we find that in the 1414 cases of penile cancer reported by these official and individual observers, only 33 (2·4 per cent.) occurred in circumcised men, as against 1374 (97·2 per cent.) in uncircumcised men living in the same communities. To these figures, if we add 1103 penile cancers reported in the United States, we have a grand total of 2484 penile cancers reported in uncircumcised men (Americans, Indians, and Javanese), as against 33 cases reported in circumcised men, all Muhammedans. Not a single case is reported in a circumcised Jew.

It is of some interest to inquire into the possible reason for the occurrence of penile cancer in Muhammedans, even to the slight extent of 2·4 per cent., as compared with the total immunity which characterises the Jews. The reason, I believe, is to be found in the fact that while ritual circumcision in Jews is performed on the eighth day of life, the Muhammedans perform their rite much later—between the fourth and ninth years. It is conceivable that in the presence of a foreskin, particularly if unretractible, there may occur the added chemical irritation due to retained secretions and the mechanical effects of dried smegma constantly eroding the delicate mucous surfaces. These irritating factors, acting for a period of four to nine years, may well be sufficient so to modify the character of the affected tissues as to constitute the necessary foundation for the later development of cancer, even though the offending prepuce had been removed at some time during youth.

This hypothesis is seemingly supported by recent reports in medical literature. R. O. Stein [21] discussing the occurrence of cancer on the inner surface of the prepuce in boys and young men with congenital phimosis, concluded that the malignancy arises from chronic irritation of the balanitic condition set up by the phimosis and that the precancerous stage can be recognised in the leukoplakic lesions usually observed in these cases. In three cases of penile cancer examined pathologically by Dormanns [22] in China, the men were 24, 26, and 34 years old respectively, and in all of them the cancer had developed on a greatly inflamed surface. Chavannaz and Magendie [23] report a case of a man of 31, treated in June, 1926, for phimosis and balanitis, who returned nine months later with an ulcerating cancer. One may safely surmise that while it is possible that the cancer in this case might have been prevented if circumcision had been done when the "balanitis" was under treatment, it is even more probable that the precancerous condition had already existed for some time and was erroneously diagnosed as "balanitis."

Further, it is generally known that penile cancer occasionally develops in men who were circumcised in adult life.[‡‡] "Many years may elapse," says Muhlpfordt [24] "before the precancerous condition

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[‖] Personal communication, June 2nd, 1931.

[‡‡] In three of the series of 837 cases which I have collected, cancer had developed in men who had been circumcised in maturity. Inquiries made to determine when and why the operation had been performed failed to elicit this information.

SPECIAL ARTICLES

CIRCUMCISION AND PENILE CANCER.

By Abr. L. Wolbarst, M.D.,
of New York.

Commenting editorially on a previous contribution [1] to this subject, The Lancet said [2]:

> "*If Dr. Wolbarst is right in his conclusion as to the comparative freedom* [from penile cancer] *of the circumcised, his argument for universal circumcision is a strong one. If, on the other hand, he is misinformed about the rarity of penile cancer in Jews and Mohammedans it should be easy to prove him in error.*"

The main purpose of the present contribution is to clear up the doubt expressed in this editorial regarding the efficacy of circumcision in infancy as a prophylaxis against penile cancer.

Incidentally, the present study has provided the opportunity of arriving at a reasonably accurate estimate of the rate of incidence of penile cancer, as compared with cancer in men generally.

I confidently believe that the data herewith presented fully justify the following conclusions:

1. Cancer of the penis does not occur in Jews circumcised in infancy. There is no authentic case on record. It has occurred in an uncircumcised Jew.
2. Penile cancer does occur rarely in Muhammedans, who practise ritual circumcision between the fourth and ninth year, but not in infancy. A few cases have been recorded.
3. Penile cancer occurs almost exclusively in the uncircumcised, particularly in those with phimosis, and occasionally in men circumcised in adult life.
4. There is no racial immunity against penile cancer in Jews or Muhammedans. The one common factor which induces immunity is circumcision in early life.
5. Penile cancer constitutes at least 2 per cent. and possibly 3 per cent. of all cancer in men.
6. The annual mortality from penile cancer in the United States is about 225, all—or at least most—of which can be prevented by circumcision in early life.

The data upon which these conclusions are based were obtained through: (*a*) a questionnaire, (*b*) the medical literature, and (*c*) personal correspondence.* The questionnaire was regarded as the most effective method of obtaining the American morbidity-rate of penile cancer and its relation to circumcision, by interrogating a large number of hospitals throughout the country. From their replies it was hoped to obtain the morbidity-rate of penile cancer (for the period 1925–1930) as compared with cancer in men generally, and the rate of incidence, if any, in Jews, as bearing on the question of prophylaxis by circumcision in infancy. The questionnaire was sent to all skin and cancer hospitals, to all Jewish hospitals, and to 1250 of the largest general hospitals in the United States and Insular Possessions.† Replies were received from 421 hospitals representing every State in the Union,‡ as follows:

(*a*) 15 "general" hospitals reported that they do not accept cancer cases;

(*b*) 28 hospitals in 19 States reported no cancer cases of any kind in men;

(*c*) 43 hospitals in 21 States could not answer any of th questions submitted because of the manner in which th records are kept;

(*d*) 38 hospitals in 20 States reported no penile canc cases, but could not report their total number of canc cases in men;

(*e*) 92 hospitals in 31 States, with a daily average of 13,5 patients, reported 4607 cases of cancer in men without a single case of penile cancer;

(*f*) 26 Jewish hospitals in 11 States, with a daily avera of 4751 patients, 73 per cent. Jewish, reported seven cas of penile cancer, all in non-Jews. Fifteen of these institutions reported a total of 2166 cancer cases in men, while th remaining 11, including some of the largest and mo prominent, were unable to furnish this information becau of the manner in which their records are kept;

(*g*) 33 hospitals in 23 States, with a daily average o 8053 patients, 5·5 per cent. Jewish, reported 120 pen cancers, all in non-Jews. They were unable to report th total number of male cancer cases because of their record system;

(*h*) 146 hospitals in 37 States, with a daily average 32,656 patients, 3·4 per cent. Jewish, reported 710 pen cancers, all in non-Jews, in a total of 43,849 male canc cases—a penile cancer-rate of 1·62 per cent. in men.

Adding together the number of penile cancer cases i groups (*g*) and (*h*) we have a total of 830 cases of peni cancer, all in non-Jews, reported by 179 hospitals in States, having a daily average of 40,709 patients, of whic 4·4 per cent. are Jewish. To the above must be add seven cases of penile cancer (also in non-Jews) reported 26 Jewish hospitals, in which 73 per cent. of the patients a Jewish.

The grand total of penile cancer cases, therefore, is 83 reported by 205 hospitals in almost every State of Union, for the years 1925–1930.

It is of more than passing interest to note th one case of penile cancer in a Jew was reported by mid-West hospital, but this man had not be circumcised. This lends emphasis to the conclusi that the immunity of Jews to penile cancer is racial, but is due solely to the crucial fact th circumcision eliminates the major factor in development of penile cancer—namely, the prepu These data are fully supported by a survey of literature on the subject. A few instances suffice. In 1907, Barney [3] reported 100 cases penile cancer, all in non-Jews. More recent Dean [4] reported 75 cases, Schreiner [5] 60 cas Shivers [6] 5 cases, and Howze [7] 17 cases, all in n Jews. To these may be added nine cases seen myself (not published) also in non-Jews. In all these reports emphasis is laid on the presence phimosis as the predominant predisposing cau Howze furthermore urges circumcision at an ea age as a prophylactic measure. A review of th data reveals the striking fact that not a single case penile cancer in a circumcised Jew has been repor in a total of 1103 cases in the United States, desp the fact that Jews constitute about 3 per cent. the American population.

Sorsby [8] has shown that the incidence of can generally in Jews does not differ from that of n Jews. In England and Wales, he says, the mortal from penile cancer constitutes nearly 0·7 per ce of all male cancer deaths, and in Vienna ab 0·4 per cent. Nevertheless, Sorsby was unable find a single case of penile cancer recorded in 2 male cancer deaths investigated among the Jews London and Vienna. Furthermore, in an extens study of 40 cases of penile cancer made by Foder in 1926, none of the patients was a Jew, and in principal Jewish hospital in Vienna there had be no operation for penile cancer in 11 years.

A similar observation is made by F. L. Hoffma who made a *special* study of cancer among the Je rom these data it is fair to infer that there is irect relationship between the lack of hygienic of the male genitals and the occurrence of penile er, and that it is most common among peoples hom ignorance and poverty combine to maintain ital hygiene at its lowest standards.

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* My thanks are particularly due to Dr. F. L. Hoffman, consulting statistician of the Prudential Life Insurance Co., and to Dr. Joseph Muir, medical director of the Radium Emanation Corporation, for their valuable contributions of statistical data.

† Only those "general hospitals" having 100 beds or more, as rated by the hospital number of the Journal of the American Medical Association, were addressed.

‡ As a matter of convenience, Alaska, the Philippines, Canal Zone, Hawaii, and Porto Rico are tabulated as individual States.

§ Personal communication, April 13th, 1931.

t is a curious fact that while all students of penile cer recognise the ætiological importance of mosis and uncleanliness and recommend circum- on only as a means of relief for the phimotic dition, most of them fail to recognise in early umcision a perfect prophylactic agent against mosis and its possible sequelæ. This attitude based on the fallacy that retractibility of the puce protects against the accumulation of patho- ic products in the preputial cavity, and therefore minates the foreskin as a potential factor in the usation of penile cancer. Lewis,[37] however, states at 19 of his cases had retractible foreskins without history of phimosis, five had acquired phimosis ring the growth of the tumour, and only nine gave history of long non-retractible foreskin; and he operly concludes that the retractibility of the epuce "is not insurance against retention of the egma."

It must be obvious to all who care to see that these nditions, arising basically in the unclean preputial vity, can be prevented by the simple medium of rcumcision in infancy, to say nothing of the many ther hygienic advantages of this procedure. Why ait until "balanitis" with its cancerous potentialities as supervened? It is a gratifying sign that the ractice of non-Jewish parents of having their male hildren circumcised early in life is rapidly growing n the United States, despite the myopic opposition f medical men who persist in regarding the foreskin s something holy and sacred. The active head of the most important anti-cancer organisation in this country writes me, "I don't think you have to plead cancer prophylaxis in justifying circumcision. Most of the children of my friends are circumcised early for general hygienic reasons." Circumcision of all male infants is therefore urged as a general hygienic measure and particularly, in this connexion, as an almost certain preventive measure against the later development of penile cancer.

SUMMARY.

(1) The morbidity-rate of penile cancer in the United States is at least 2 per cent. and possibly 3 per cent. of all cancer in the male; it is about 15 per cent. in the Far East. (2) Phimosis is universally recognised as the most important factor in the causation of penile cancer. (3) There is no record of a case of penile cancer in a circumcised Jew. (4) One case of penile cancer is reported (in this paper) in an uncircumcised Jew. (5) Two hundred and five American hospitals and six individual observers report 1103 cases of penile cancer in the United States, all in non-Jews. (6) Twenty-six Jewish hospitals (included n the above) do not report a single case of penile ancer in a Jew. (7) Penile cancer occurs rather rarely (2·4 per cent.) *in Muhammedans; in India and* Java, 33 cases of penile cancer were reported in (circumcised) Muhammedans, as against 1381 in uncircumcised men living in the same communities. If we add 1103 penile cancers reported in the United States, we have a grand total of 2484 penile cancers reported in uncircumcised men (Americans, Indians, and Javanese), and 33 in circumcised men, all Muhammedans. Not a single case is reported occurring in a circumcised Jew. (8) There is no racial immunity against penile cancer in Jews and Muhammedans. The immunity is provided by the practice of circumcision in early life. (9) Leukoplakic conditions leading eventually to cancer may be observed in boys and young men. Years may elapse before the conditions are recognised as frankly malignant. (10) Circumcision in adult life or adolescence does not protect fully against future malignancy because of the tissue damage already effected. (11) "Chronic balanitis" in the middle-aged or elderly should always be regarded as potentially malignant. (12) At least 225 deaths annually in the United States, and 150 in England and Wales, and probably twice as many non-fatal cases can be prevented by the circumcision of all male children in infancy.

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38. Matz, P. B.: U.S. Veterans' Bureau Med. Bull., 1926, ii., 707.
39. Legueu, F., and Michon, E.: Maladies de la Vessie et du Penis, Paris, 1912, p. 315.
40. Föderl, V.: Deut. Zeit. f. Chir., 1926, cxcviii., 207.
41. Walker, K. M.: Diseases of the Male Generative Organs, London, 1923, p. 186.
42. Englisch, J.: Wien. med. Woch., 1902, lii., 1929.

SWINDON ISOLATION HOSPITAL.—The mayor of Swindon, Alderman J. L. Calderwood, last week opened a new administrative block this hospital, providing 33 bedrooms and 15 bathrooms.

OTLEY DERBY CLUB.—It is proposed to continue and extend the operations of this club, which was formed in the early part of last year. The annual subscription was fixed at 10*s.*: it was provided that 20 per cent. of the receipts should be given to hospitals, and that the remainder of the money would be given in prizes upon the result of the Derby. The membership reached nearly 45,000 and £4500 was distributed among British Hospitals. The first prize-winner in the Derby event received £5000, the second £2500, and the third £1000. The balance was devoted to the purchase of the club premises and the cost of maintenance.

passes over into a clinically and histologically recognisable malignant tumour." In 3 per cent. of Dean's cases,[4] leukoplakia unquestionably preceded the cancer, but all of these patients had been circumcised in adult life, "probably for sufficient cause." It is reasonable to assume that the leukoplakia, admittedly present, was the most probable cause. In Schreiner's series of 60 cases,[5] eight gave a history of circumcision before the beginning of the disease, and in one case the *epithelioma appeared one year after the circumcision.* He does not state why the operation was performed, but there is usually a good reason. Lloyd Lewis,[37] in a report of 70 cases of epithelioma of the penis (Brady Urologic Clinic, Johns Hopkins Hospital),§§ referring to several cases in his series, says, "it is entirely possible that both of these patients had early malignancy at the time of their circumcision."

In these and other cases with a similar history the explanation is probably the same. The foundation for the cancer was laid during the years of irritation provoked by the abnormal conditions within the preputial cavity, and the fundamental trauma of the tissues had already been permanently effected when the circumcision was done. The fact that the circumcision scar is often the seat of the cancer lends further support to this view, inasmuch as cancer does not occur in the scar of Jews circumcised in infancy and but rarely in Muhammedans.

The conclusion is inescapable that the irritation in the preputial cavity may begin in early life and that the tissue damage thus produced may persist as a foundation for cancer long after circumcision has been performed. All of which gives point to the conclusion that the earlier in life circumcision is done the less danger there is of the development of *cancer in later life. The maximum degree of protection* is provided by circumcision in infancy, as exemplified in the 100 per cent. immunity enjoyed by the Jewish race. In other words, where there is no foreskin there will probably be no cancer.

That this immunity is not racial, as Young[25] and others believe, is made evident by the occurrence of penile cancer in the case of the uncircumcised Jew already referred to, and by the almost complete immunity enjoyed by Muhammedans of non-Semitic origin. Commenting on this aspect of the subject, Sorsby[8] emphasises the fact that the Indian Muhammedans are not allied to the Jews racially, as the Arabians are, and that the one common factor shared by Jews and Muhammedans in this respect is the "habit of circumcision." In short, penile cancer is absent, not in races, but in those communities in which circumcision is practised as a ritual. It is the absence of a prepuce from the earliest days of life that provides the immunity against cancer.

MORBIDITY-RATE OF PENILE CANCER.

We have seen that the questionnaire elicited complete responses from 146 hospitals, in 37 States, having a daily average of 32,656 patients. These institutions reported a total of 43,849 cancers in men, of which 710 were penile—a rate of 1·62 per cent. But *this cannot be accepted as the final morbidity*-rate for penile cancer; other factors must be taken into consideration. First is the fact that cancer is not a notifiable disease, and it is quite certain that a considerable number of penile cancers, not fatal and therefore not in the vital statistics, are "covered up" for social and family reasons and thus remain unrecorded. Again, all penile cancer cases do not go to hospitals for treatment. Many cases are successfully treated by irradiation and X r
at doctors' offices and out-patient clinics. Th
there are the cases in which the growth rema
undiscovered for many months, death occurri
because of some accident or intercurrent dise
E. Langer[26] reported the case of a man of 68 who h
phimosis. On making a dorsal incision, he fou
a flat ulcerating squamous-called carcinoma und
the foreskin. There must be many such case
I have encountered two myself. In one, the m
had been treated during nine months for balanit
and the epithelioma was discovered only when t
prepuce was slit open; in the other case, five mont
had elapsed before the diagnosis was made by dor
incision.

In view of these circumstances, taking as a b
the 1·62 percentage in the 146 hospitals referred
it is a conservative estimate that the morbidity-
of penile cancer is at least 2 per cent. and poss
3 per cent. of all cancers in men. This esti
is approximately one-half that of the famous surge
Winiwarter,[27] 2·55 per cent., and Billroth,[28] 3·10
cent., of all cancers in both sexes. Englisch,[42] i
extensive study of the literature, concluded that
morbidity-rate of penile cancer was 1·78 per c
as compared with cancer in men generally, and
per cent., compared with cancer in both sexes.

MORTALITY-RATE.

While this paper is not concerned with
mortality-rate, it is pertinent to consider it b
as an indication of the seriousness of penile c
as a cause of death and its relative frequen
various localities. According to the United
Census Bureau, there were 144,206 deaths i
United States from cancer in males in 1927, 192
1929. Of these, 654 were penile, a rate of 0·
cent. In England and Wales[29] in the same
the rate was 0·61 per cent. In the hospitals
U.S. Veterans' Bureau, P. B. Matz[38] reported
deaths from penile cancer in the fiscal years 19
Of these, two were in the age-group 30–39 an
in the age-group 40–49. The total number of
from malignant tumours in these groups wa
which makes the mortality-rate for penile
2·4 per cent. In Colombo (Ceylon) penile ca
extraordinarily common. Spittel,[30] one of
surgeons in the General Hospital, operated
cases in four years. He says: "The specific i
seems to be the pent-up smegma, caked an
integrated; for congenital phimosis is the
invariable accompaniment." He adds, signific
that "carcinoma of the penis is never se
Moors who practice circumcision." Maxwell,
cussing penile cancer in China, reports that
total of 558 cases of cancer there were 88 can
the penis (15·8 per cent.). In Chinese tin-min
Vogel[32] reported five penile cancers in a total
cancers in men (10 per cent.). In 1929,
Federated Malay States,[33] out of 69 cases whic
to autopsy, eight were penile cancers (12 per

Lieut. Commander R. P. Parsons, of the
Navy, reporting on *conditions in Haiti, says*:—

> "Although there are no statistics on hand, I ca
> with certainty that cancer of the penis in Haiti is ex
> common—more so than anywhere else I've been, a
> in spite of the fact that cancer in general in Haiti i
> what less common than in countries in the Temperat
> This fact I attribute to the almost complete lack of
> cision in Haiti. It is practically unknown there.
> the very low state of personal hygiene, either in kn
> or in practice. Bathing is common enough, but few
> men would think of cleansing the mucous surface
> prepuce."

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§§ These cases are included in the series of 837 cases which have collected.

‖‖ Personal communication, Oct. 22nd, 1931.

al weekly and monthly working hours. In the e mills, for instance, in July, 1929, the working urs were increased from 54 to 60 per week, the ger hours resulting in increased earnings. In July, 30, they reverted to the 54-hour week, and in lition closed down completely for one week in each nth; but compensation was given for the shorter ek in the form of an increase in wage rates, and a osistence allowance was paid during the week of eness. Some decrease in the average monthly rnings was inevitable, but owing to these measures was only slight. Considering the circumstances, tal emoluments seem to have been maintained rprisingly well.

The architectural features of many considerable ctories still leave much to be desired, and, owing primitive conditions, it is not always possible to force the regulations rigidly. One case is quoted here immediate enforcement would have thrown 00 people out of work, but a remedy was eventually und during a change-over to electric power. The remises of half the registered printing presses are rdinary dwelling-houses, and are not as a rule atisfactorily lighted or ventilated. Trouble arises in uch cases from injurious gases, and lead poisoning is serious problem. Many orders were issued during he year to printing presses, but it is evidently very ifficult to get reasonable precautions against lead oisoning carried out. Washing can usually be rranged for, but even in the larger presses food precautions are a difficulty, owing to the impossibility of getting people of different races and castes to eat together. It is a common practice for employees to bring their dinner with them, and keep the food beside them while at work. This difficulty has been met in a large railway press by having three separate mess-rooms for Hindus, Mohammedans, and Anglo-Indians, but it is obviously impossible for the smaller establishments to make such arrangements. The report states that the prevalence of lead poisoning, even in registered printing presses, cannot be denied, while investigation of the appalling conditions in some of the unregistered presses suggests that it must be much more prevalent in them.

The result of a general survey of the housing conditions of the larger factories is distinctly encouraging. In spite of lean years considerable advance is being made in Calcutta, as in Bombay, where a large amount of excellent accommodation is available in great blocks of flats, the chief difficulty being to induce the workers to leave their slum dwellings to inhabit them. But, with the exception of tea factories, in the smaller concerns employees usually have to fend for themselves, usually in mean and congested areas. In tea factories, labour recruited from jungle areas in the north often prefers flimsy bamboo huts, thatched with grass, to more permanent dwellings, one reason being the superstitious custom of firing a hut after a death in it, to drive away evil pirits.

The average number of women employed during the year in registered factories was 73,951, as against 77,966 in 1929, and of children 16,630, as against 23,036. The general tendency in jute mills is to eliminate children, and out of 91 mills 45 have dispensed with child labour entirely, despite the fact that children, on account of their height, are better fitted than adults for the shifting work on spinning frames. Generally speaking, it appears that the conditions of employment of both women and children are improving, and both the Government inspectors and the Society for the Protection of Children are evidently on the alert to discover cases of abuse. Only children of 12 years or more are eligible for employment in factories.

The report is not optimistic about sanitary arrangements. In the larger factories hygienic conditions have made moderate progress, but in the smaller little improvement is manifest. Even where good latrine accommodation is provided it is often abused. In the smaller factories conditions are commonly abominable, and repeated prosecutions seem to have little effect. Some advance is being made in the installation of septic tanks, and the Willas aerobic septic tank is mentioned favourably. One difficulty is the uncleanly habits of the mill hands, who frequently use surface drains for latrine purposes, thus fouling the effluent. Complaint is made of the fouling of the Hooghly river, which furnishes part of the water-supply of Calcutta, in this way. It is suggested that legislation should be provided which would give no option to the intending employer of a certain number of workers but to erect a septic tank latrine.

Ventilation also is the despair of the factory inspector, owing to the unsuitable premises in which many of the smaller firms carry on their work, but special attention is being paid to manufacturing processes in which dust and fumes are generated. A dry-battery factory and an electric steel foundry are cited as instances in which orders were issued for the installation of extractor fans in large establishments, but in the smaller factories the cost of such a system would be prohibitive. It is surprising to read that tea factories are amongst the worst offenders for the generation of dust. The present depression of the industry is an obstacle to progress in the way of fitting efficient trunk systems for the removal of tea fluff.

Apart from a severe epidemic of malaria in the Calcutta area the general health of operatives was normal. Maternity benefit schemes have been very successful, and are greatly appreciated by the workers. An important development which is attributed to the Whitley Commission was the decision of the Indian Jute Mills Association to establish welfare centres, baby clinics, and creches in all mills within their membership.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE.

Surg.-Comdr. H. H. Ormsby is placed on the retd. list.

Surg.-Comdr. C. J. Aveling is placed on the retd. list with the rank of Surg. Capt.

ROYAL NAVAL VOLUNTEER RESERVE.

Surg. Lt.-Comdr. R. H. O. B. Robinson is placed on the retd. list at his own request.

ROYAL ARMY MEDICAL CORPS.

Maj. (temp. Lt.-Col.) J. C. L. Hingston to be Lt.-Col.

Maj. A. E. B. Jones to be temp. Lt.-Col.

Capt. F. V. Cant relinquishes his temp. commn. and retains the rank of Capt.

TERRITORIAL ARMY.

Lt. E. T. Colville, from Active List, to be Lt.

INDIAN MEDICAL SERVICE.

Lt.-Col. L. Cook to be Col.

ROYAL AIR FORCE.

Group Capt. H. Cooper, Honorary Surgeon to The King, is placed on the retd. list.

COLONIAL SERVICE.

Dr. N. J. Abbensetts has been appointed M.O., Boundary Commission, British Guiana; Dr. L. R. Levy, M.O., Jamaica; and Dr. D. C. Ogilvie, M.O., Leeward Islands.

MEDICINE AND THE LAW.

Escape of Child from Institution.

ACTS of Parliament are ineffective if they march ahead of public opinion. In particular, measures of social reform which involve official interference with family life encounter a resistance from parents which magisterial authority (reflecting public opinion in some degree) seems disinclined to quell. Prosecutions under Section 12 of the Children Act, where a parent refuses to allow a child to undergo some necessary and proper surgical operation, are not unfamiliar; the magistrates realise that the parents' feelings are natural if mistaken and, as a rule, they explore any expedient sooner than impose a penalty. A similar tendency appears in recent proceedings under Section 53 of the Mental Deficiency Act against a mother for assisting her daughter to escape from an institution. There was a summons also against the father for secreting his daughter. For the London County Council it was explained that the child had attended various mental deficiency schools and in April last was recommended for treatment at an institution in Hampshire. Last September she was allowed out with her mother on the understanding that she would return the same evening. She did not return and eventually was found at her parents' house in Islington. The father told the local authority's officer that the girl was in a good situation and had a good home. He refused information and invited prosecution; "I will go to prison," he said, "it is a shame she is not to be allowed out." When the case came before the Clerkenwell police-court, the magistrate invited the legal representatives on both sides to confer. As a result the L.C.C. representative said that, if the child was allowed to go back to the Hampshire home, he would do all in his power to facilitate action by the parents to have the order set aside; the parents' representative assented to this compromise. The metropolitan police-court bench is to-day unusually rich in able and experienced magistrates. They use their discretion to the great advantage of us all. But such reluctance to enforce the law teaches the social reformer the lesson that there are limits to what can be achieved by mere Act of Parliament.

Dangerous Drugs Act: Charge against Medical Attendant.

George Edward Williams, described as a medical attendant, was charged at Marlborough-street police-court a fortnight ago with being in unauthorised possession of morphine sulphate and cocaine hydrochloride contrary to the Dangerous Drugs (Consolidation) Regulations of 1928. A representative of the Director of Public Prosecutions outlined the case against him. It was alleged that Williams was acquainted with a Dr. Kirton, who formerly had a surgery at Foley-street, and that, when Dr. Kirton left, Williams took a lease of the premises and practised there as a doctor. Chemists gave evidence that they had supplied drugs to him in the belief that he was a registered medical practitioner. It is alleged that in one case he actually prescribed a dangerous drug.

On remand last week it was stated that a further charge of forgery is likely to be preferred. The case was adjourned pending the completion of inquiries.

THE LÜBECK TRIAL.

(FROM OUR BERLIN CORRESPONDENT.)

(*Continued from p. 102.*)

IT was expected that the hearing of witnesses and of medical experts would end on Jan. 11th, and tha after an interval of three days the public prosecutor, counsel for parents, and counsel for the accused medical men and nurse will plead. The verdict wil thus probably not be pronounced before Jan. 20th This long trial will thus finally be closed after a duration of about three months.

In the course of the trial the question was discussed whether the disaster could have been avoided if the physicians had not assumed that the infant G., the first victim, had suffered from congenital tuberculos Prof. Schürmann, of Berlin, gave evidence that aft the administration of the vaccine swelling of th cervical glands had developed. In congenital tuber culosis an isolated swelling of the cervical glands without other symptoms, seldom occurred. Th infant G., having been the first who showed suc symptoms after the administration of the B C G, i would have been better to consider the possibilit that the disease had been caused by that administra tion. If the attending physician had known that i the laboratory the B C G was cultivated together wi virulent tubercle bacilli he would certainly have h that suspicion. Unfortunately there was only litt collaboration between the physician of the childre hospital, Prof. Klotz, and the head of the laborator Prof. Deycke. Prof. Deycke's duty as a bacteriolog would have been to stop the distribution of the tu as soon as he was informed that an infant had beco ill, until he had tested in animals the condition the emulsions. Prof. Klotz replied that he had reas to believe that the infant G. suffered from congen tuberculosis, because the mother was tuberculo When the glandular swelling extended he had remov a piece of a gland for bacteriological examination, ascertain whether B C G or human bacilli were pres The examination of the gland had convinced him t the case was one of congenital tuberculosis. He still of that opinion, because tuberculosis could be acquired so soon after the administration of B C G. In fact, the other infants became ill several weeks afterwards. He had not been infor that in Lubeck not only infants from tubercu families, but all the new-born children were to treated with the B C G.

INDUSTRIALISM IN INDIA.

A REPORT FROM BENGAL.

A SAMPLE of Indian industrial conditions is provi by the annual report for 1930 on the administra of the Indian Factories Act in Bengal. The num of registered factories had increased from 148 1555 since the previous year but of these 111 did work at all, this number including 44 rice mills, 1 mills, 14 general engineering workshops, and 11 presses. The number of operatives was 441,51 against 466,741 in the previous year, and even in there had been changes in the general condition workers and their wages as a result of the indus depression. Many mills had to revert to the si shift, and various modifications were made in

CORRESPONDENCE

POINTS IN THE NOTIFICATION OF INDUSTRIAL DISEASES.

To the Editor of THE LANCET.

R,—Many medical men are, I am afraid, unaware ieir statutory obligation to notify certain industrial ases. I may quote two recent examples in regard -oxic jaundice, one a series of cases due to tetra-rethane, and the other a series due to arseniuretted rogen. Only one of the cases was notified by a lical practitioner. In regard to the series due to niuretted hydrogen, notification of the earliest would have led to the adoption of measures ch might, it is anticipated, have prevented the urrence of subsequent cases, including two deaths. s serious result alone seems to be ample justification asking you to allow me to draw the attention the profession to the very important statutory uirement of notification of industrial poisoning ler the Factory and Workshop Acts, 1901–1920, 1 Lead Paint (Protection Against Poisoning) Act, 26.

Every medical practitioner attending on, or called to visit, a patient whom he believes to be suffering m any of the following :—

Lead poisoning,
Phosphorus poisoning,
Arsenical poisoning.
Mercurial poisoning,
Carbon bisulphide poisoning,
Aniline poisoning,
Chronic benzene poisoning.
Anthrax,
Toxic jaundice,
Epitheliomatous ulceration or
Chrome ulceration,

contracted in any factory or workshop,

required by Section 73 of the Factory and Workshop ct, 1901, under penalty, to notify the case forthwith the Chief Inspector of Factories. Home Office, ondon, S.W.1, and by Section 3 of the Lead Paint rotection Against Poisoning) Act, 1926. he is also quired to notify lead.poisoning contracted by any rson employed in, or in connexion with, the painting any building whether or not that building is a factory workshop, unless it has already been so notified ; ıd he is entitled to a fee of *2s. 6d.* for so doing.

Forms for notification will be supplied on application to the Chief Inspector of Factories, Home Office, ondon, S.W. 1.—I am, Sir. yours faithfully,

JOHN C. BRIDGE,
H.M. Senior Medical Inspector of Factories.
Factory Department, Home Office, Whitehall, S.W.,
Jan. 11th, 1932.

MULTIPLE PRIMARY CARCINOMA IN THE BUCCAL CAVITY.

To the Editor of THE LANCET.

IR,—The case recorded by Lord Moynihan in hich carcinoma developed at intervals in different arts of the buccal cavity is to some extent paralleled three cases recently under treatment at the Cancer ospital, and it may be that added interest attaches, that radium was used to treat the initial lesion.

In all three cases the patients were elderly males, nd the initial lesion "epithelioma" was in the nterior part of the floor of the mouth. In all three ases sound healing occurred without any sign of cal recurrence, and there was no connexion clinically etween the initial lesion and the growth that followed.

In one case the second growth involved the soft palate and fauces, and was noticed two years after the initial lesion had been treated. In the second case a mass of glands developed a year after treatment, and examination showed an ulcerated area in the pyriform fossa on the same side. In the third case, death from carcinoma of the pharynx and breaking down glands occurred 17 months after treatment to the floor of the mouth.

Every surgeon with experience of excision operations on the tongue will endorse Lord Moynihan's contention as to the rarity of local recurrence thereafter. Attached to the Cancer Hospital for 20 years as surgical registrar and surgeon, I have not met with such a happening. The fallacy instanced is one that has been quoted to me several times recently by candidates for higher surgical qualifications.

Radium for the last few years has to a large extent displaced surgery in the treatment of carcinoma of the tongue, and it may be that this myth as to local recurrence after surgical removal owes its origin and growing currency to those rising radiologists and surgeons whose clinical experience has been confined to this period.

This question of recurrence is surely fundamental if any attempt is to be made to assess the relative value of different methods of treatment, and it is of importance therefore that inaccuracy should be corrected.—I am, Sir, yours faithfully,

PERCIVAL P. COLE.
Wimpole-street, W., Jan. 11th, 1932.

A NEW METHOD OF APPROACH TO THE SEMILUNAR CARTILAGES OF THE KNEE-JOINT.

To the Editor of THE LANCET.

SIR,—I fear that Mr. Harry Platt has misinterpreted the purport of my Clinical Note with the above title (THE LANCET, Dec. 26th, 1931). I have made no claim there or elsewhere to be the originator of the "combined anterior and posterior approach to the semilunar cartilage," although I first performed the operation in 1924, before, as far as I am aware, any reference had been made to this method in surgical literature. It certainly appears that to the late Mr. Alwyn Smith is due the credit of first publishing the "combined anterior and posterior approach" (*Journal of Bone and Joint Surgery*, April, 1925). Whatever claim to originality my method possesses lies in the particular mode of combined approach advocated, which, from an experience of eight years. I believe to possess special advantages. On referring to the late Mr. Alwyn Smith's method of approach. I find certain fundamental differences between his method and mine, which must be immediately obvious to anyone who compares the two methods and accompanying diagrams. For instance, Mr. Alwyn Smith advocated *two separate incisions*, the posterior of which is *vertical ;* and his method of opening the posterior part of the joint capsule differs from mine. Also in my method, the semicircular flap permits the internal lateral ligament to be freely exposed and this structure acts throughout the delicate operation as an exceedingly helpful surgical landmark. When Mr. Platt states that the procedure described by me is "familiar to most orthopædic surgeons in this country," I presume that he is referring in a *general*

PANEL AND CONTRACT PRACTICE

Health Insurance Certification: Complaints of Misleading Statements.

THE East Sussex Insurance Committee has had occasion to complain of misleading certificates being issued by three practitioners. After examination of the circumstances and after taking into account the doctor's explanations, the committee has recommended the Minister of Health to withhold the sums of ten, five, and seven guineas respectively from the remuneration payable.

In the first of the three cases the patient was an elderly woman suffering from advanced rheumatoid arthritis and unable to move about her room unaided. In a series of monthly certificates, giving the cause of incapacity as rheumatoid arthritis, the practitioner stated that he had examined the patient on the dates named. The certificates were dated in Nov. and Dec., 1930, and in the first five months of 1931. Some time after the latest of them the patient signed a statement that the practitioner last called to see her about six months ago. When the question was taken up last June, the practitioner admitted he had not visited or seen her between November, 1930, and June, 1931. Before signing the certificates, however, he had satisfied himself that there was no change in her condition by inquiry of the Queen's Nurses who reported to him weekly. He practised in the town in which the patient lived, and at no great distance from her home. The Medical Service Subcommittee's comment was that the practitioner did not frankly admit his fault but seemed to harbour the idea that his error was merely technical and that he could throw some of the responsibility upon the Queen's Nurses. The subcommittee pointed out that no practitioner can delegate his responsibility for issuing certificates of incapacity; certification is not a mere technical matter nor does it fall within the category of merely clerical work. "It is essential," they observe, "that medical men should realise that certification for National Health Insurance purposes is an essential part of their duty. The obligation to visit once a month a patient who was practically bedridden cannot, in the subcommittee's view, be considered unduly onerous."

The second case was that of a practitioner who gave a monthly certificate in each of the first five months of 1931 for a patient 57 years of age suffering from carcinoma of the stomach. Each certificate stated that the practitioner had examined the patient on the date named; the cause of incapacity was given as "gastric neoplasm" or "abdominal neoplasm." Last June the patient signed a statement that the practitioner had not visited him since the previous December, though passing his door twice a week. The patient was able to go for walks and could easily have visited the surgery. He did not visit the surgery, nor did the doctor visit him, during the period covered by the certificates; but it did appear that the doctor had seen him walking about the village at about the dates of the certificates. The certificates were given to the patient's wife who called at the surgery for them. The patient lived in a small village some miles from the doctor's house; but the doctor had a surgery in the village within fifty yards of the patient's house; the doctor attended this surgery on Thursdays; all the certificates were dated on Thursdays. The subcommittee conceded that the practitioner was under no obligation to call on the patient; it was for the patient to present himself at the surgery. The patient had at times suffered from mental aberration and there was perhaps a doubt of the effect which a visit to the surgery might have had on his mental condition. As already stated, this practitioner did see his patient but not in the professional sense. The subcommittee considered that, while an exhaustive physical examination may not be necessary on every occasion when a certificate is issued, the practitioner must see the patient in a professional capacity, and take proper steps to confirm his expectation, based on previous knowledge, that the patient remains incapable of work.

In the third case it was again the fact that the patient had the obligation to call at the practitioner's surgery rather than that the doctor had to visit the patient. In both the second and third cases the doctor seems to have erred out of good nature, giving certificates to the patient's wife to avoid giving trouble. In the third case the patient was aged 58, and suffered from rupture, piles, epileptic fits at rare intervals and other ailments, definitely making him quite unfit for work; he had been receiving benefit since the beginning of 1927. The practitioner gave him eleven certificates between Oct. 8th, 1930, and the end of July, 1931; the first five indicated the cause of incapacity as "Con. after pneumonia," the last six, "Con. after pneumonia; epilepsy." In each certificate the practitioner stated that he ha examined the patient on the date named. Las August the patient signed a statement that it wa fifteen months, as far as he could remember, sinc the doctor came to the house to see him. The patier was quite able to walk to the doctor's place of ca in his village but did not do so. At an earli period the patient had come in person for his certi cates; during the time of the eleven certificat he had sent his wife for them; after the questic had been raised, the practitioner insisted on tl *plaintiff coming personally* for his certificates.

The subcommittee expressed appreciation of t frankness with which the second and third prac tioner admitted carelessness. The period of irregul certification was twice as long in the third case as the second. Such considerations explain the diff ence in the sums recommended to be withheld in t three cases. In all three cases there were cert mitigating elements. The subcommittee could dr attention to the fact that in each case there w chronic disease and undoubted incapacity, th monthly certificates were justifiable, that acti treatment would have produced little or no rel or improvement and that, in consequence of t foregoing elements in each case, the approved soci was not prejudiced by paying out benefit not prope due. It is nevertheless impossible to resist t Insurance Committee's conclusion that the certifica contained false and misleading statements, or challenge its conclusion that the issue of su certificates deserves grave censure.

BIRMINGHAM HOSPITAL SUNDAY FUND.—At t annual meeting of this fund last week it was sta that since 1859 a total of £103,541 had been collected, average, after deducting a fraction over 6 per cent. for expenses of administration, of £4953 a year. The collecti in 1931 fell below the figure of the previous year by nea £500. There has, indeed, been a steady decrease for sc years past, which is attributed to the university studer carnival being held on the day before Hospital Sunday.

›ut of print for very nearly 20 years, though ıerished possession of all who wish to obtain ;ve information on clinical signs, symptoms, ›ntial diagnosis. It is only natural that se works are out of date when considered ›resent-day point of view, yet there is ;le word which those who love these works ɔ see cut out in a new edition—one would ːem added to, but not cut down.

ıg time since anything of so great an English medical literature has appeared on, but last week's LANCET gave a ɔrk by one who may be a newcomer to 'ish classics. Dr. Needham's "Chemical [1] in three volumes has been produced ›sire to present a complete account of the English language, and that he has can be no doubt. His book, like a ıd, presents many facets; it possesses ıarm and distinction, great learning, ːal material and, at the same time, etailed biochemical material. It is a biochemist writing on embryology. s, both gross and microscopical, will see what they must have considered mpart broken down and crossed by an invading horde of, to their mind, can imagine His and Von Graefe graves at the thought of embryology the hands of the morphologist into ochemist. The younger generation has ent of the cutter of sections and the of embryos. Admittedly, these workers s of their labours may be able to explain rare congenital cardiac malformation but in the dealing with this they have, of the slightest interest except to obtain nicely useum specimens; or, on the other hand, rches enable a physician to give a clinical the embryological basis of cleft palate and All these vaunted advantages for the knowembryology can only strike the practical ːist as belonging to the irritating phenomena wise after the event. Dr. Needham's work ıg a great flood of enthusiasm into the study ·ology from an entirely new aspect. This heartily recommended to all professors of who torture their students with details ıg the closure of the pleuro-peritoneal , since here they will find a constructive and ve science as compared with one of almost gical interest.

I am, Sir, yours faithfully,

th, 1932. DODDERER.

ENTIVE MEDICINE IN ITS RELATION TO AVIATION.

To the Editor of THE LANCET.

May I be permitted to call attention to a ıt liable to misinterpretation in my article subject in your last issue? In a sentence ng the disposal of excreta (p. 112) I do not imply that the Air Ministry regulations he dropping of excreta from the air. On the , they forbid it.

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Then there is of 1927. begs, borrows, or s by the enthusiast between graph explaining hi money to produce a first of cancer or on, let us say, the treatment ected by our side on the This type of work is easily dete doubtful w medical bookseller and is put the knowledge that it is extreme produ a solitary copy will ever be sold.

Then, again, there is the type of careful and clinical authors with object of making money, either sales or indirectly through the oblique Many of the volumes in this catalogue productions and are greeted with book salesman.

On an infinitely higher plane there few books which have been written author or authors wished to present a completeness and entirety in such a work would stand for ever as a perfect presentation of the views which were he time. The author of such a work prod the same reason, we should imagine, produced "Paradise Lost," not from an motives of gain either in the direction or of scientific notoriety. It is a r that such works are usually a failure from lative point of view. It is considered unwis to a living book, but the dead may be without there being any suggestion of indi licity. Two such deceased books come to of the writer, and by "deceased" is mean print. Firstly, there is Schafer's "Text-Physiology." One would have thought work would have sold out edition after ed been the standard English text-book on There can be no doubt that had it been in Germany by some well-known Germa would already have run into many editions followed by a long string of grandchildren in of Erganzungsbanden. As it stands at pr one edition has been published, and that in 1900; yet to the discriminating view it is great text-book on physiology and bioche second book is Allbutt and Rolleston's Medicine," one of the only successful medicine published by English authors.

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puzzle the retailer is that on some abstruse
written by an unknown and junior man. Th
however, a belief that when a young man
and obtains a position on the staff of a
a registrar, the writing of a book would do
great deal of good. He therefore writes a boo
through the influence of one of his seniors
a wealthy relative, persuades the publisher to
it for him. Undoubtedly the work invo
looking up the original literature, if he
this, will have benefited the author, but too
is such as to make everyone wonder
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result for work; another type of book, that
a work ing of 1927. begs, borrows, or

Then there is between graph explaining
by the enthusiast first of cancer or
money to produce a mon afte cted by our
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licity. Two such deceased books come
of the writer, and by "deceased" is m
print. Firstly, there is Schafer's "Te
Physiology." One would have though
work would have sold out edition after
been the standard English text-book on
There can be no doubt that had it b
in Germany by some well-known Germ
would already have run into many edit
followed by a long string of grandchildren
of Ergänzungsbanden. As it stands at
one edition has been published, and that
1900; yet to the discriminating view it
great text-book on physiology and biochem
second book is Allbutt and Rolleston's
Medicine," one of the only successful
medicine published by English authors.

hospital and are sent to the statistical branch ie public health department at County Hall, e they are punched, for tabulating purposes, and passed through a counting machine. This iine, a four-column sorting counter, will count iumber of holes punched in each of four columns e rate of 20,000 cards per hour. If, for instance, is desired to know how many patients were ed in the various types of ward, how the nts were admitted, how they were discharged, the reason for their discharge, the machine would et to count on certain columns. If, in addition, rards, for instance, were required to be examined rately in respect of other data, the machine would et to sort on column 14, in which numbers 0 to rrespond respectively to maternity, mental and rvation, venereal, tuberculosis, isolation, general ical, and general surgical wards, and would rer the cards in separate packs for each class of l.

ie standard procedure, adopted in the Council's ral hospitals is that bed cards are kept at the l of the patient's bed, but clinical notes are kept he charge of the ward sister; prescriptions diets are entered on the bed card, so that the case rs need never leave the wards. While for istical material prepared for the service as a whole lity is unavoidable, considerable elasticity is wed in the type of printed forms used by individual pitals. A form of report for the information of school medical service upon elementary schooldren treated in the general hospitals has been pted by the Committee.

he Committee on the *Staffing of Transferred itutions* reported a consensus of opinion that the ices of consultant staff should be freely available the patients in the Council's hospitals, but laid n no definite policy in regard to the best method mployment of such staff. Consideration was given this connexion as to how the Council's hospital rice could best assist in the provision of well ined and experienced medical men as private ctitioners. The Committee believe that owing the difficulty of obtaining resident appointments the teaching and other well-known hospitals, ie men and women enter private practice nediately after qualification without the advantage residence in a hospital; they recommended that far as possible resident house physicians or house geons or clinical assistants (non-resident) should employed at all the general hospitals in order provide opportunities of hospital experience.

They recommended that candidates for the post assistant medical officer should have already held resident hospital appointment, and that besides good general knowledge of institutional work they ould have begun to take a special interest in some rticular branch. In order to prevent the retention mediocrity in the service, it was strongly recomended that appointments to the grade of assistant lical officer should be for a limited period, which, was suggested, should be for not more than four ars. At the end of this service the appointment an assistant medical officer should be terminated less he had applied for inclusion in, and had been cepted for the "*promotion list*"—i.e., a list of imes of those considered suitable for and awaiting icancies in the grade of senior assistant medical licer. It was further recommended that provision iould be made for a free interchange of medical aff between all the hospitals.

The remuneration suggested by the Committee for a medical superintendent ranged from £900 with varying maxima to £1650, together with an unfurnished house.

THE COUNCIL'S ADMINISTRATIVE SCHEME.

In framing an administrative scheme the Council endeavoured as far as possible to provide that the transferred services should be merged in the Council's existing organisation and allocated to the committees of the Council to which they were appropriate.

Having regard to the varied character of the cases dealt with at the several institutions under its control and the manner in which the accommodation for such cases was distributed, the Council felt that it would not be desirable, even had it been practicable, to earmark particular institutions for specified purposes, and that any attempt to do so would seriously prejudice the formulation of a scheme for reclassifying and otherwise dealing with the transferred institutions. Before any such scheme could be prepared, it would have been necessary for a complete survey to be made of the existing buildings and the nature of the accommodation thereat. The Council was, however, in agreement with the principle enunciated in Section 5 of the Local Government Act, 1929, as to the desirability of making arrangements for the full exercise of the powers under the special Acts at the earliest possible date. It therefore decided to include in the administrative scheme a general declaration that it was the intention of the Council that, as soon as circumstances permitted, all assistance which could after April 1st, 1930, be provided either by way of poor relief or by virtue of any of the special Acts mentioned, other than the Maternity and Child Welfare Act, 1918, should be provided exclusively by virtue of the appropriate special Act, and not by way of poor relief. This would be in accordance with one of the main objects of the Act—to secure that as soon as practicable the existing duplication of powers should be brought to an end, and that each form of assistance should be in the hands of one, and not more than one, branch of the Council's organisation.

As regards the administration of the Maternity and Child Welfare Act, 1918, the position in London is complicated owing to the fact that the City Corporation and the metropolitan borough councils are the authorities under the Act. The Council proposes to give further consideration to this whole matter at a later stage.

Central Public Health Committee.—A very considerable part of the transferred work fell within the purview of the Public Health Committee, the membership of which was enlarged; members who were not members of the Council were coöpted and the reconstituted Committee was designated "The Central Public Health Committee."

The Committee deals, inter alia, with the provision, classification, maintenance, and management of hospitals for the sick, other than mental hospitals, and arranges for their visitation, and assumes responsibility for a number of children under 3 years of age formerly in the receiving homes and schools of the guardians.

For the purpose of hospital administration, the county was at first divided into five areas. Later this division was abandoned, but the preparation of statistics for this volume was already well advanced, and this early classification is retained in presenting some of the statistics and other information given in this report.

The questions involved in the separation of the able-bodied poor from the sick, especially in view of

PUBLIC HEALTH SERVICES

LONDON COUNTY COUNCIL.

ANNUAL REPORT OF THE MEDICAL OFFICER OF HEALTH FOR 1930.

BETWEEN the closing of office hours on the evening of March 31st and the morning of April 1st, 1930, 76 hospitals and institutions, containing over 42,000 beds and a staff of nearly 20,000, were transferred to the public health department of the London County Council. Prior to that date they had been administered by the late Metropolitan Asylums Board and the 25 Metropolitan Boards of Guardians, and thereafter they constituted one great hospital service under central direction and control.

In his first report[1] on the work of the hospitals and institutions transferred to the Council, Sir Frederick Menzies gives some account of how this great task was achieved. The basis of the smooth transference was the realisation that changes of procedure should not be too hastily made. Much preliminary work had been done in anticipation of the change, and many conferences had been held; meetings of medical superintendents, matrons, and stewards had been convened, and six months before the appointed day the head office staff had been strengthened by the appointment of a matron-in-chief and three principal medical officers. During the course of the year, it has been necessary to appoint four senior medical officers in the General hospitals division, and one (divisional) medical officer was newly appointed to assist the principal medical officer of the Special hospitals division.

One of the earliest major problems which faced the department was the difficulty in obtaining nurses, whether qualified or probationer, to fill vacancies as they arose. Consideration was next given to the best way of examining various important matters on which comprehensive reports would eventually have to be submitted to the Central Public Health Committee. It was decided to try experimentally the appointment of departmental committees representative of all the interests concerned to act in an advisory capacity; the first five committees appointed considered the treatment of tuberculosis, forms and records, the ambulance service, medical supplies, and pathological laboratory facilities respectively.

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[1] Vol. IV. (Part I.), Public Health. Report on the Hospitals and General Medical Services under the Control of the Central Public Health Committee. London: P. S. King and Co. 1931. Pp. 207. 2s. 6d.

(Continued from previous page.)

interesting to your readers, for he had long outlived most of his professional contemporaries. Bird, outside his professional work, lived in the typical environment of mid-Victorian society. He had a small private practice, most of his patients being his friends or their relatives, and to these he was a wise and considerate adviser. He had a very attractive manner and appearance, and was popular in Mayfair and Bohemia. As a young man he had been a good oar—he was captain of his college boat club—and an adept skater. Until advanced life he had consulting rooms in Conduit-street, where he saw patients by appointment, but for several years he had entirely retired from practice and lived in the country. He will be missed by many of his juniors, especially at the United University Club where he was an habitué."

DEPARTMENTAL COMMITTEES.

The experiment proved successful and later committees were appointed on hospital standards; the staffing of transferred institutions; on medical appointments; on appointments to th intermediate grades of nursing staff (above sta nurse and below assistant matron) and of scho nurses; and to the senior grades of domestic staff The personnel of all these committees is described some of them included experts on the subjects unde consideration not in the service of the Council.

One of the most important perhaps from the poi of view of hospital management throughout th country is that on *hospital standards.*

The terms of reference were: to consider wh general standards, if any, should be adopted for th structure, equipment, and maintenance, includin staffing and methods of heating, lighting and ventil tion, of the public hospitals of London; and t consider also what hygienic standards, if any, shou be adopted for the institutions, homes, or poor la schools transferred to the Council under the Loc Government Act, 1929.

The members of the Committee are: *London Coun Council:* Dr. W. A. Daley (Chairman); Dr. V Brander; Dr. J. A. H. Brincker; Dr. H. Nockold Dr. W. T. Gordon Pugh; Mr. R. Robertson; an Mr. F. R. Hiorns. Mr. R. Coleman (Secretary *Ministry of Health:* Dr. Seymour and Mr. Scot *Director of Central Bureau of Hospital Informatio* Mr. R. H. P. Orde.

It is believed to be the first body representati of architectural and medical opinion set up in th country to study scientifically the problems of hospit construction and administration. After a prelimina study of existing conditions in hospitals at home a abroad the Committee considered such matters as a and bed space standards, and the best lay-out of war for the acute sick, maternity cases, children's sectio and isolation units. A plan was also prepared of model operating theatre unit. Its recommend tions are provisional at present, but are placed record as a basis of discussion. Various types ward accommodation and plans have been prepar to illustrate suitable lay-outs of ward blocks f different types of cases.

The Committee also considered carefully th question of standardising certain items of hospit furniture and equipment; its work is likely to exter over a considerable period of time.

To the Departmental Committee on *Forms a Records* was entrusted the task of considering wha were the most suitable books, forms and records t be kept in, or in connexion with, the transferr hospitals, including not only medical case-papers an all forms relating to medical work, forms f admission and discharge, notice to patient's friend but also statistical returns. One outcome of t deliberations of this Committee was the decis to use mechanical tabulation in the Council's hospita Some of the interesting results obtained from th returns thus compiled are appended to the repor and the possibilities for statistical investigation a obviously greatly increased by the adoption uniform records.

The standard form of card used is reproduced black spots indicating the position of punched holes which correspond with the entries on the card.

The cards are entered up from the case-papers a

L NORTHERN HOSPITAL, Holloway-road, N.-

INTENSIVE WEEK.

ONDAY, Jan. 18th.—2.15 P.M., Mr. Kenneth Walker: Some Points in the Diagnosis and Treatment of Urinary Calculi. 3.15 P.M., Mr. W. B. Gabriel: Surgical Ward Cases.

UESDAY.—2.15 P.M., Mr. F. D. Saner: Selected Cases. 3.15 P.M., Mr. A. M. Zamora: Endoscopic Methods and Treatment.

EDNESDAY.—2.15 P.M., Dr. Bernard Schlesinger: Demonstration in Children's Ward. 3.15 P.M., Dr. Henry C. Semon: Diseases of the Buccal Mucosa.

HURSDAY.—2.15 P.M., Mr. Eric I. Lloyd: Pseudocoxalgia. 3.15 P.M., Mr. G. G. Penman: Injuries to the Eye.

RIDAY.—2.15. P.M., Dr. P. O. Ellison: Pathological Investigations. 3.15 P.M., Dr. Claude Gouldesbrough: Fractures.

RING CROSS HOSPITAL MEDICAL SCHOOL.

UNDAY, Jan. 17th.—10.45 A.M., Dr. W. J. Adie: Early Symptoms of Common Nervous Injuries. 11.45 A.M., Mr. L. R. Broster: Head Injuries.

DON SCHOOL OF DERMATOLOGY, St. John's Hospital, Leicester-square, W.C.

UESDAY, Jan. 19th.—5 P.M., Dr. G. B. Dowling: Seborrhœa. Seborrhœic Dermatitis.

HURSDAY.—5 P.M., Dr. I. Muende: Pathology Demonstration.

ARK'S HOSPITAL, City-road, E.C.

HURSDAY, Jan. 21st.—4.30 P.M., Mr. W. B. Gabriel: The Elucidation of Rectal Symptoms.

ERSITY COLLEGE, Gower-street.

UESDAY, Jan. 19th.—5 P.M. (in the Physiology Theatre), Mr. H. R. Ing, D.Phil.: Chemotherapy (first of six weekly lectures).

'S HOSPITAL, London Bridge, S.E.

ONDAY, Jan. 18th.—5 P.M., Prof. J. M. W. Morison: The Use of X Rays in Physiological Investigations (first of eight lectures).

HOMAS'S HOSPITAL, Albert Embankment, S.E.

ONDAY, Jan. 18th.—5.30 P.M. (in the Governor's Hall), Prof. W. J. Tulloch: Serological Studies on Vaccinia (first of three lectures).

G'S COLLEGE HOSPITAL MEDICAL SCHOOL, Den-rk-hill, S.E.

HURSDAY, Jan. 21st.—9 P.M., Mr. H. Edwards: Minor Surgery.

TRAL LONDON THROAT, NOSE, AND EAR HOS-TAL, Gray's Inn-road, W.C.

FRIDAY, Jan. 22nd.—4 P.M., Mr. C. Gill-Carey: Rhinological Aspects of Asthma.

PETER'S HOSPITAL, Henrietta-street, W.C.

WEDNESDAY, Jan. 20th.—3 P.M., Mr. J. Swift Joly: Examination of Urological Patients.

AL INSTITUTE OF PUBLIC HEALTH, 37, Russell-uare, W.C.

WEDNESDAY, Jan. 20th.—4 P.M., Sir William Willcox: Ætiology of Rheumatism, with Special Reference to Infective Causes.

AL MATERNITY AND WOMEN'S HOSPITAL, Glasgow.

WEDNESDAY, Jan. 20th.—4.15 P.M., Dr. S. J. Cameron: Obstetrical Cases.

ULTY HALL, St. Vincent-street, Glasgow.

TUESDAY, Jan. 19th.—4 P.M., Prof. C. Browning: Serological Tests and Their Significance.

Appointments

ifying Surgeons under the Factory and Workshop Acts: Macintyre, T. G., L.R.C.P., L.R.C.S. Edin., L.R.F.P.S.G. (Tobermory, Argyll); McShane, C., M.D., Ch.B. Belf. (Barking, Essex); Middleton, G. P., M.B., Ch.B. Edin. (Ballater, Aberdeen); Lakin, F. H., M.B., Ch.B. Aberd. (Burghead, Moray); Richard, F. L., M.B., Ch.B. Glasg. (Walsall); and Williams, J. (Richmond, York).

Vacancies

or further information refer to the advertisement columns.

kenham, Kent, Bethlem Hospital, Monks Orchard.—Res. H.P. At rate of £150.

mingham, City Mental Hospital.—Sen. Asst. M.O. and Deputy Med. Supt. £550.

mingham, Little Bromwich Hospital for Infectious Diseases.—Jun. Asst. M.O. £300.

tol Royal Infirmary.—Hon. Gynæcological Reg.

diff Royal Infirmary.—Two H.P.'s and Two H.S.'s. All at rate of £50.

nbridge, Papworth Village Settlement.—Third Asst. M.O. £200.

y of London Hospital for Diseases of the Heart and Lungs, Victoria Park, E.—H.P. At rate of £100.

adnought Hospital, Greenwich.—Hon. Dermatologist.

stbourne, Princess Alice Memorial Hospital.—H.S. At rate of £150.

gow Corporation.—P.H. Dept. Pathologist. £800.

mpstead General and N.W. London Hospital, Haverstock-hill, N.W.—H.P. At rate of £100.

rrogate General Hospital.—H.P. £150.

rrogate Infirmary.—Sen. H.S. £150.

Hertford County Hospital.—H.P. At rate of £150.

King Edward Memorial Hospital, Ealing.—Jun. H.S. £150.—

L.C.C.—Sen. Asst. M.O.'s for Hospital Service. Each £500.

Leeds Hospital for Women.—H.S. At rate of £100.

Leicester, City Mental Hospital, Humberstone.—Second Asst. Res. M.O. £400.

Liverpool and Samaritan Hospital for Women.—Hon. Asst. Surgeon.

Liverpool, David Lewis Northern Hospital.—Four H.S.'s and Two H.P.'s. Each at rate of £100.

Liverpool Eye and Ear Infirmary.—Ophth. H.S. £120.

Manchester City.—Asst. Tuber. O. £650.

Manchester, Radium Institute.—Asst. M.O. At rate of £400–£500.

Manchester, St. Mary's Hospitals.—Four H.S.'s and Jun. Asst. M.O. All at rate of £50.

Manchester, Withington Hospital.—Asst. M.I. £300.

Mile End Hospital, Bancroft-road, Mile End, E.—Asst. M.O. £350.

National Hospital, Queen-square, W.C.—Hon. Surg. Asst.

Newcastle General Hospital, Newcastle-upon-Tyne.—Res. Med. Assts. Each at rate of £150.

Northampton General Hospital.—Hon. Ophth. Surgeon.

Queen's Hospital for Children, Hackney-road, E.—Surg. to Ear, Nose, and Throat Dept.

Retford, Notts, Rampton State Institution for Mental Defectives.—Fourth M.O. £400.

St. Alfege's Hospital, Vanbrugh Hill, Greenwich, S.E.—Asst. M.O. £350.

St. John's Hospital, St. John's Hill, S.W.—Asst. M.O. £350.

St. Mark's Hospital for Cancer, Fistula, and Other Diseases of the Rectum, City-road, E.C.—H.S. At rate of £75.

St. Mary Abbot's Hospital, Marloes-road, Kensington.—Asst. M.O. At rate of £250.

St. Peter's Hospital for Stone, &c., Henrietta-street, Covent Garden, W.C.—Anæsthetist. £25.

Sheffield Children's Hospital.—H.S. and Cas. O. At rate of £80.

—Ophth. H.S. At rate of £80.

for Women, Clapham Common, S.W.—Surg. Reg. 50 guineas. H.S. At rate of £100. Also Anæsthetist 10*s.* 6*d.* per attendance.

Swindon and North Wilts Victoria Hospital.—Res. M.O. £125.

Weir Hospital, Grove-road, Balham, S.W.—Jun. Res. M.O. £150.

Western Ophthalmic Hospital, Marylebone-road, N.W.—Sen. Res. H.S. At rate of £150.

West London Hospital, Hammersmith-road, W.—Non.-Res. Cas. O. £250. Also Hon. Obstet. Reg.

Windsor, King Edward VII. Hospital.—H.S. At rate of £100.

Worcester General Infirmary.—Jun. Res. M.O. £120.

The Chief Inspector of Factories announces vacancies for Certifying Factory Surgeons at Petersfield (Hants), Hoddesdon (Herts), Malvern (Worcs.), Pontrhydygroes (Cardigan), Shaftesbury (Dorset), Bexhill (Sussex), Lyndhurst (Hants), Modbury (Devon), Alresford (Hants), and Cranborne (Dorset).

Workmen's Compensation Act: Medical Referee for Wolverhampton (Circuit 25). Applications should reach the Private Secretary, Home Office, Whitehall, not later than Jan. 30th.

Births, Marriages, and Deaths

BIRTHS.

AMOR.—On Jan. 8th, at The Cottage, Clydach, Swansea, the wife of Arthur J. Amor, M.D., of a daughter.

WARNER COLLINS.—On Jan. 9th, 1932, at Chartfield, Putney, S.W., to Leona, wife of Dr. Warner Collins—a daughter.

EDMONDSON.—On Jan. 5th, at Dalkeith House, Clarendon-place, Leamington Spa, the wife of Dr. Edmondson, of a son.

SHACKLE.—On Jan. 5th, the wife of J. W. Shackle, M.R.C.S., L.R.C.P., of Ardanoir, Purley Bury Close, Purley, of a son.

WIGHT.—On Jan. 3rd, the wife of Cecil H. Wight, M.C., M.R.C.S., L.R.C.P., of Wangford, Beccles, of a son.

MARRIAGES.

WILLIAMS—PRATT.—On Jan. 9th at St. Stephens, Lewisham, Harry Bowen Williams, M.D. (Brux.), M.R.C.S., L.R.C.P., of Brockley, S.E., to Cassie Ethel Pratt, M.R.C.S., L.R.C.P., of Bexley Heath and Jerningham-road, New Cross, S.E.

DEATHS.

GREVES.—On Jan. 12th, following an operation, Edwin Hyla Greves, M.D., F.R.C.P., of Rodney House, Bournemouth. Funeral service at St. Michael's Church, Bournemouth, on Friday, the 15th, at 2 o'clock.

PRICE.—On Jan. 8th, at Guernsey, Spital-road, Maldon, Henry James Price, F.R.C.S., London, aged 77.

VAUGHAN.—On Jan. 5th, in London, Colonel Joseph Charles Stalke Vaughan, I.M.S., C.I.E.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages and Deaths.

UNIVERSITY OF LONDON MEDICAL GRADUATES SOCIETY.—An afternoon meeting of this society will be held at the London School of Hygiene and Tropical Medicine, on Thursday, Jan. 21st, at 4 P.M., when demonstrations and films will be shown and tea will be served. All medical graduates of the University are invited, whether members or not. Tickets are obtainable from the hon. secretaries of the society at 11, Chandos-street, W.1.

the varying degrees of sickness, were found very difficult of settlement, and before coming to any conclusions it was found desirable to attempt a definition of what was meant by "the sick." For this purpose it was considered convenient to divide all persons receiving medical and nursing attention in the poor-law hospitals and mixed institutions into the following classes:—

(1) Patients needing continuous medical or surgical treatment (acute sick);
(2) Patients needing institutional treatment because they are suffering from some chronic disease, also aged and infirm persons requiring medical and nursing attention (chronic sick);
(3) Maternity patients (excluding infants) (acute sick);
(4) Mental patients (acute sick);
(5) Healthy infants (under 3 years of age), excluding those in the maternity wards.

For the accommodation of the acute and chronic sick it was considered desirable that two types of hospitals should be recognised—viz., hospital "A" for the acute sick and hospital "B" for the aged and infirm and those suffering from chronic disease.

Acute sick.—Examination of statistics of patients in relation to the number of beds available in hospitals in various areas led to the conclusion that although a central administration of all the hospital beds and rearrangement of accommodation would, it was anticipated, bring about a higher average occupation generally, yet the available accommodation for the acute sick would be inadequate for future needs.

Chronic sick in mixed institutions.—The types of inmates in the mixed institutions included:—

(1) Aged persons who are up and about;
(2) Aged persons and others who are suffering from debility, chronic bronchitis, chronic rheumatism, chronic heart and arterial disease, and chronic kidney disease, &c.;
(3) Paralysis cases;
(4) Cancer cases;
(5) Mental defectives and epileptics.

It was difficult among this heterogeneous mass of chronic sick, aged, and infirm persons, to define accurately the degree of infirmity or disability that places a person in the category of the "sick."

The Administrative Scheme did not place under the direction of the Committee any institution of the mixed type, but with the concurrence of the Public Assistance Committee, it was agreed that 12 institutions with accommodation for over 2500 should be allocated as hospitals to provide for the "chronic sick."

The proposed allocation left, for the time, accommodation for "healthy" cases (approximately 2770) in the hospitals under the Central Public Health Committee, and accommodation for "chronic sick" (approximately 5120) in the *institutions* under the direction of the Public Assistance Committee. In order to allow time, which may be considerable, for reorganisation and reclassification, the agreed allocation was regarded as provisional only.

(*To be concluded.*)

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED JAN. 2ND, 1932.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 54 (last week 32); scarlet fever, 1579; diphtheria, 910; enteric fever, 40; pneumonia, 2139; puerperal fever, 20; puerperal pyrexia, 105; cerebro-spinal fever, 33; acute poliomyelitis, 6; acute polio-encephalitis, 1; encephalitis lethargica, 7; dysentery, 15; and ophthalmia neonatorum, 92. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals o London County Council on Jan. 5th–6th was as foll Small-pox, 82 under treatment, 8 under observation (week 75 and 1 respectively); scarlet fever, 1329; diphthe 1510; enteric fever, 7; measles, 661; whooping-co 431; puerperal fever, 16 (plus 11 babies); enceph lethargica, 224; poliomyelitis, 2; "other diseases," At St. Margaret's Hospital there were 20 babies (plus mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, inc London, there were no deaths from small-pox, 1 from enteric fever, 47 (14) from measles, 1 (1) fr scarlet fever, 48 (11) from [illegible] diphtheria, 81 (22) from d [illegible] two years, and 240 (53) from influenza. The figu in parentheses are those for London itself.

Eight of the cases of measles were reported f Manchester and 6 from Stoke-on-Trent. Whooping-co caused 8 deaths in Birmingham and 6 in Liverpool. Ele of the fatal cases of diphtheria were in Hull and 5 Liverpool. Diarrhœa and enteritis accounted for 7 dea in Liverpool, 6 in Manchester, and 4 in Cardiff. Of deaths attributed to influenza, 17 were in Manchester 11 each in Birmingham and Liverpool.

The number of stillbirths notified during the w was 289 (corresponding to a rate of 44 per 1000 t births), including 46 in London.

Medical Diary

Information to be included in this column should reac in proper form on Tuesday, and cannot appear if it re us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street,
TUESDAY, Jan. 19th.—5.30 P.M., General Meetin Fellows. 8.30 P.M., PATHOLOGY. Papers: Dr. J. Blacklock: The Primary Lung Focus of Tuberc in Children. Dr. Dorothy Russell: Tumou Ependymal Origin. Dr. Oliver Heath: Serum Ch in the First Week of *B. typhosus* Immunisation
THURSDAY.—5 P.M., DERMATOLOGY (Cases at 4 Cases: Dr. Norman Burgess: 1. Case for Diag ? Lupus Erythematosus. Dr. F. Knowsley S 2. Seborrhœic V [illegible] (shown previous [illegible] Multiple Erythe [illegible] hypertrophic, Juvenile and Distal Forms at Di Stages.
FRIDAY.—5 P.M., DISEASE IN CHILDREN (Cases at 4.30 8 P.M., EPIDEMIOLOGY AND STATE MEDICINE. Dr. N. Howard Mummery: Some Aspects of Ind Medicine.

ROYAL SOCIETY OF TROPICAL MEDICINE HYGIENE, Manson House, 26, Portland-place, W.
THURSDAY, Jan. 21st.—8.15 P.M., Dr. C. M. We F.R.S.: Leishmaniasis and the Problem of its mission. (Demonstration at 7.45 P.M.)

HUNTERIAN SOCIETY.
MONDAY, Jan. 18th.—9 P.M. (at the Apothecaries' Water-lane, E.C.), Prof. von Eiselsberg (Vi How Rontgen has helped in Modern Surgical Dia (Hunterian Lecture).

CHELSEA CLINICAL SOCIETY.
TUESDAY, Jan. 19th.—8.30 P.M. (at the Hotel Remb Thurloe-place, S.W.), Mr. Guy C. Pollock (*The M* *Post*) and Sir Squire Sprigge (Editor of *The L* will open a Discussion on Medicine and the The meeting will be preceded by dinner at 7.3

EUGENICS SOCIETY.
TUESDAY, Jan. 19th.—5.30 P.M. (at the Rooms Linnean Society, Burlington House, W.), Eu and Party Politics. Speakers: Representati Different Political Parties.

LECTURES, ADDRESSES, DEMONSTRATIONS,

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Li Inn Fields, W.C.
MONDAY, Jan. 18th, and following WEDNESD FRIDAY.—5 P.M., Sir Arthur Keith: Malform of the Human Body from a New Point of Vie

UNIVERSITY COLLEGE HOSPITAL MEDICAL SC University-street, W.C.
TUESDAY, Jan. 19th.—5.15 P.M., Dr. R. A. O' Preparation Testing and Use of Antitoxin.

NOTES, COMMENTS, AND ABSTRACTS

AFNESS AND ITS PREVENTION.*

AURICE SORSBY, M.D. LEEDS, F.R.C.S. EDIN.,
, EAR, NOSE, AND THROAT DEPARTMENT, PLAISTOW
REN'S HOSPITAL; ASSISTANT SURGEON, EAR, NOSE,
THROAT DEPARTMENT, LONDON JEWISH HOSPITAL;
REGISTRAR, EAR, AND THROAT
DEPARTMENT, GUY'S HOSPITAL.

RING and vision are the two senses which give
information of the visitant world. Taste,
and muscle-sense tell man only of things with
he is in immediate contact, and smell, though
for information for remote objects, does not
him greatly in that capacity. The world of
rson who is both deaf and blind is pitifully
The deaf-blind moves in the larger world,
not of it.

tragedy of blindness is widely recognised,
e the disabilities of blindness are frequently
it home to normal people when they find
lves in darkness. But deafness strikes no cord
the deaf are at the very least
the blind, for deafness is isolation
in a large world the joy of which
s from social contact. The deaf much more
he blind are thrown on to their own resources.
iousness, the most precious of joys, is denied
m. They stand outside the pale. The blind
in the melée of life. The deaf always move in
on.

n Keller, herself blind, deaf and dumb, rates
orror of deafness above that of blindness.
problems of deafness" she says, "are deeper
ore complex, if not more important, than those
dness. Deafness is a much worse misfortune.
means the loss of the most vital stimulus—the
of the voice—*that brings language, sets thought
and keeps us in the intellectual company of man.*"
tial deafness is a much greater disability than
l blindness, and the lesser degrees of auditory
are much more crippling to social and individual
than the lesser degrees of visual defect.
e in vision will certainly handicap a man in
lised work for which full visual acuity is
sary, but decline in hearing hinders social life
very-day duties.

the problem of deafness is as urgent on the
dual side as that of blindness, it is equally
t as a social problem, for deafness and auditory
take as large a numerical toll as blindness
visual defect. Statistics with any approach to
acy are not available for the general population,
the figures supplied by the school medical
e for 1927 are of interest.[1] Thus there were
ngland and Wales, 1925 totally blind children,
ver twice as many totally deaf children, namely
In the case of partial defect, the proportions
eversed: as against 4929 partially blind, there
2053 partially deaf children. The extent of
r auditory defect is far greater than is generally
ined, though it is not so great as that of minor
l defect. Thus, repeated examinations at
ls reveal some degree of visual defect in about
er cent. of children. The extent of auditory
t seems to vary with the type of school popula-
It is generally given as about 25 per cent.
ildren. Thus, Barr (Glasgow, 1890) found it to
7·66 per cent.; Bezold (Munich, 1885), 25·8 per
, and Denker (Erlangen, 1906), 23·3 per cent.,
es which agree closely with the 29·5 per cent.
d by Dr. Mable Russell[3] in 1930, in a group of
unselected children in the London County Council
ols. The extent of deafness in the adult popula-
is unknown, but there can be no doubt it is much higher than the 25–30 per cent. seen in school-children. The problem of the deaf is much larger than is generally imagined.

The Causes of Deafness.

No doubt the majority of cases of partial deafness are due to acquired causes. Analyses of available statistics concerning children whose hearing is sufficiently defective to require their attendance at a deaf school shows that acquired causes are responsible for a proportion varying between 35 to 75 per cent. (see Table I.).

TABLE I.—*Showing Proportions of Congenital to Acquired Deafness in Schools for Deaf Children.*

Source.	Deaf children examined.	Born deaf.	Acquired.	Unknown.
		Per cent.		
Glasgow Institution for the Deaf (Kerr Love)[1]	214	52·8	44·5	2·3
National Institute of the Deaf (1928)[1]	2946	56·0	35·0	9·0
Amer. Annals of the Deaf[1]	4649	44·0	44·0	12·0
(American) National Research Council[4]	5348	62·3	—	—
L.C.C.[2]				
1909–17.. ..	1863	35·1	60·0	4·9
1919–28.. ..	1630	24·7	68·0	7·3
1929–30.. ..	277	21·7	75·1	3·2

The conflicting nature of the figures in this Table is no doubt due to the different standards employed by different bodies for the admission of children to deaf schools. The relatively low proportion of children born deaf in the L.C.C. figures is due to the care bestowed by the L.C.C. on the partially deaf children by admitting them to the special schools. For the understanding of the possibilities in the prevention of deafness it is necessary to analyse the causes in greater detail.

CONGENITAL DEAFNESS.

A child born deaf may be the victim of frankly hereditary forces or of an obscure lesion. Hereditary deafness is assumed when the family history points in that direction; sporadic congenital deafness when no such influence is obvious. Aphasia is responsible for a small number.

The relative proportion of hereditary to sporadic deafness varies with different statistics. The L.C.C. figures for 1919–1928 report 83 true hereditary deaf against 305 sporadic deaf-born. The line of division between the two is not always easy. The existence of a deaf relative, or even of a deaf parent, is no proof that the new-born child is the subject of hereditary deafness; nor, paradoxical as it sounds, is the absence of deafness in the parents evidence that the deafness is not hereditary, for the parents may be carriers of deafness without themselves being deaf. It is the family history extending to many generations, with undisputed evidence of deaf-mutism, that constitutes conclusive evidence of true hereditary deafness. It is more than possible that some forms of deafness in adults have a familial tendency, but the predisposition to deafness developing in adult life is something distinct from deafness at birth, with its consequent dumbness.

The problem of hereditary deaf-mutism was sharply focused in 1883 by Graham Bell, in his classical memoir on "The Formation of a Deaf Variety of the Human Race."[5] Bell pointed out that, of the "2262 congenital deaf-mutes, more than half, or 54·5 per cent., had deaf-mute relatives; and in the case of those pupils who became deaf from apparently

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residential address, London Jewish Hospital Medical
ty.

MEDICAL NEWS

Royal College of Surgeons of England.

Forthcoming lectures at the College begin with six by Sir Arthur Keith on Malformations of the Human Body considered from a New Standpoint. These will be given at 5 P.M. on Mondays, Wednesdays, and Fridays, from Jan. 18th to 29th. The other Hunterian lecturers are Mr. J. P. Hosford on Some Factors in the Causation of Hydronephrosis (Feb. 1st); Mr. R. T. Payne, on Excretion Urography (Feb. 3rd); Dr. Remington Hobbs, on Puerperal Sepsis (Feb. 5th); Dr. J. A. Ryle, on the Natural History of Duodenal Ulcer (Feb. 8th); Prof. H. A. Harris, on the Comparative Anatomical Aspect of the Prenatal, Infantile, and Adult Disease in Man and Animals (Feb. 10th and 12th); Prof. W. Le Gros Clark, on the Structure and Connexions of the Ophthalmic Thalamus (Feb. 17th and 19th); and Dr. A. J. E. Cave, on the Morphological and Functional Anatomy of the Human Cervical Spine (Feb. 22nd). As we have already announced, Mr. Wilfred Trotter will give the Hunterian oration on Monday, Feb. 14th, at 4 P.M. All the other lectures mentioned are at 5 o'clock

University of Liverpool.

At recent examinations the following candidates were successful:—

D.P.H.

A. Ashworth, Elizabeth M. Harding, R. L. McMorris, J. S. Mather, W. J. Pierce, J. H. Pottinger (with distinction), and A. J. Walsh.

British Medical Association: Scholarships and Grants in Aid of Scientific Research.

The Council of the British Medical Association is prepared to receive applications for *Research Scholarships* as follows: an Ernest Hart Memorial Scholarship, of the value of £200 per annum, and three Research Scholarships, each of the value of £150 per annum. These Scholarships are given to candidates whom the Science Committee of the Association recommends as qualified to undertake research in any subject (including State Medicine) relating to the causation, prevention, or treatment of disease. Each scholarship is tenable for one year, commencing on October 1st, 1932. A scholar may be reappointed for not more than two additional terms, and is not necessarily required to devote the whole of his or her time to the work of research, but may hold University or other appointments, provided the duties do not interfere with his work.—*Grants:* The Council of the Association will receive applications for Grants for the assistance of research into the causation, treatment, or prevention of disease, when preference will be given to applicants who propose as subjects of investigation problems directly related to practical medicine. Applications for these Scholarships and Grants must be made not later than Saturday, May 21st, 1932, on a form, supplied on application to the Medical Secretary of the Association, B.M.A. House, Tavistock-square, London, W.C.1. They must be accompanied by the names of three referees, competent to speak to the capacity of the applicants for the researches proposed.

Society for Relief of Widows and Orphans of Medical Men.

A quarterly court of the directors of this society was held in London on Jan. 6th, with Mr. Warren Low, the president, in the chair, and three new members were elected. The death of one of the widows was reported. She had been in receipt of grants since 1897, and had received a total of £3100. Her husband was elected a member of the Society in 1856 and died in 1897, having paid some £52 in subscriptions. A sum of £1695 was voted for the half-yearly grants, to be distributed among the 49 widows and six orphans in receipt of grants, and a further £112 10*s.* as special grants to five orphans over the age of 16—at which age the ordinary grants cease—to enable them to continue their education. The expenses of the past quarter were about £88. It was decided that at the next court the best means of making the society better known should be thoroughly discussed, since many medical men, it was stated, are unaware of its existence. Membership is open to any registered medical man who at the time of his election lives within 20 miles of Charing Cross. The annual subscription ranges from 2 to 4 guineas, according to the age of the member at the time of his election. Relief is granted only to the widows and orphans of deceased members. Further particulars may be had from the offices of the society at 11, Chandos-street, Cavendish-square, W. 1, where the secretary attends each Wednesday and Friday between 4 and 5 P.M.

London School of Hygiene and Tropical

Dr. James Fenton, medical officer of health for Kensi has been appointed an additional lecturer on public administration and practice, and Mr. L. W. G. Malc conservator of the Wellcome Historical Medical Mu to be a lecturer on racial hygiene. Both appointment honorary.

King Edward's Hospital Fund for London.

The King has sent a contribution of £1000 to the F being his annual subscription.

The Prince of Wales, as President of the Fund, appointed the following new members of the Ho Economy Committee: Miss Margaret Bigge, Dr. Thursfield, and Commander Alfred Williams.

Royal Microscopical Society.

At the annual meeting of this society, to be held at B.M.A. House, Tavistock-square, London, W.C., at 5.30 P.M., on Wednesday, Jan. 20th, Prof. R. Ru Gates, F.R.S., will give a presidential address on Nu Structure.

Hunterian Society.

Prof. A. von Eiselsberg, of Vienna, will delive Hunterian lecture of this society at a meeting at Apothecaries' Hall, Water-lane, E.C., at 9 P.M. on Mo Jan. 18th. The annual dinner will be at the May Hotel on Thursday, Feb. 11th.

Post-graduate Lectures on Sundays.

Because of the success of previous courses it has decided to hold another post-graduate course at Ch Cross Hospital Medical School on Sundays from Jan. to March 20th. Two lectures are given each day, at and 11.45 A.M. On Sunday next Dr. W. J. Adie will the series with an address on Early Symptoms of Co Nervous Diseases, and Mr. L. J. Broster will speak on Injuries. A fee is charged for the course, and appli should be made to the secretary of the School, 62, Ch street, London, W.C. 2.

Royal Sanitary Institute.

A health exhibition will be held at Brighton from 11th to 16th in connexion with the annual congress institute. The exhibits will be concerned, among things, with sanitary appliances, baths, and lava lighting, heating, decoration and furnishing of the bread, milk, and other foods and beverages; h appliances and labour-saving devices; apparatus appliances used in municipal administration; water-s disinfectants: and soaps. The address of the insti 90, Buckingham Palace-road, London, S.W. 1.

British Empire Cancer Campaign.

Sir John Bland-Sutton, vice-chairman, presided quarterly meeting of the Grand Council last Monday. following grants were approved: £3000 to the Mid Hospital for six months; £1500 to the Cancer H (Free) for six months; £150 to Dr. Thomas Lum £75 to Miss Goulston; and £17 10s. to Dr. H. P. Ba The Council received a report from the joint com of representatives of the campaign and the Mount Hospital nominating Dr. A. E. Barclay, lecturer in radiology in the University of Cambridge, to the radio research fellowship founded by Sir William Morris Mount Vernon Hospital.—A memorandum from the N Radium Fund was submitted to the Council aski coöperation of the campaign in a policy of confining treatment to those radium centres in provincial ho selected and approved by the National Radium Comm It was reported that a recent questionaire drawn the Central Bureau of Hospital Information showe there are three principal groups dealing with radi the present time: King E [illegible] administering radium to [illegible] politan area; the Nation [illegible] ing radium outside the [illegible] pendent group of over 100 centres established in ho of 50 beds and upwards in England, Scotland, and controlling approximately 16·8 g. There is also a co able quantity of radium owned privately by surge the country. The Grand Council resolved to coöpe far as practicable in helping the National Radium with its policy of radium distribution so that ever of the country shall be adequately served, and that for therapeutic purposes shall be in the hands only o well qualified to use it.—Mr. C. H. Fagge was unani elected a member of the Grand Council.

ADDRESSES AND ORIGINAL ARTICLES

COMMENTS ON SOME RECENT
CURSIONS IN THERAPEUSIS.*

SIR THOMAS HORDER, BT., K.C.V.O., M.D.,
F.R.C.P. LOND.,
PHYSICIAN TO ST. BARTHOLOMEW'S HOSPITAL.

HAVE decided to touch upon one or two of the e recent tendencies which have shown themselves he modern treatment of disease. Time permits y mentioning only a few of these, and, even so, ake but a glance at them. But this glance is not out interest, especially for those of us who, sadness be it said, can remember former things, so take a wider view than might otherwise be ible of the transitions taking place in this as in r parts of medicine.

have used the word "excursion" in the title of se remarks because I want to convey the idea t, with our limited knowledge of the causes of ase, and of the interactions produced in the y by these causes and the defensive mechanisms t are present, the most that any generation can in therapeusis is to make tentative inroads into se but partially unexplored regions, with the hope t some resultant benefit may accrue to our patients. netimes these excursions are rational, sometimes y are empirical, sometimes they have the elements great wisdom, and sometimes they are merely d adventures. They are the result of a widely erent series of impulses, which includes the know- ge accumulated by our predecessors, the discovery new facts in physiology, the provision of new tools chemistry, in physics, in mechanics, and indeed all the sciences, the temperament of the doctor, d the tolerance and credulity of the patient. For ake catholicity to be the essence of our outlook in rapeusis, as it is in medicine generally. Unless, course, we be Nature Curers, and do not believe in ugs; or Spiritual Healers, and do not believe in y material aids; or Homœopaths, and slaves to a rrow therapeutic doctrine; or follow some peculiar gue which, though it may tickle the popular agination for a time, cannot bring to the service the sick person what is surely his right to expect, e sum of all human knowledge that can possibly used on his behalf. No, I assume that we regard edicine as the child of all the sciences, and of all e arts, and therapeusis as the practical issue of edicine, directed towards the maintenance of human alth and happiness.

Therefore I omit from my survey this evening all ese limited cults, by which therapeusis is "cribb'd, bined, and confined." I also omit the various cursions that are from time to time made in that im borderland which lies between a legitimate stering of the patient's confidence—so valuable a erapeutic asset—and a gross exploitation of his ars and of his hopes. Among the 50,000 men and omen who practise medicine in Great Britain there ust needs be a few who have never quite mastered he spirit of the Hippocratic oath. Nor of the Golden ule. And there is that vexed question one is so ften asked as to whether a man may, by frequently epeating it, become convinced of the truth of something which is so obviously a lie! And charity bids us say "yes," though, when we see the fellow, and talk to him, the one thing certain is that he should never have been a doctor, but a politician! And so I omit Abram's Box, that nightmare which afflicted us a few years ago, and which I learn is still, like a rat in a hole, nibbling at the purse of that part of the public which thinks an instrument, however ill-constructed, is not likely to err like the fallible human brain. And I omit those Electrotherapeutics that are peculiar in that "no one has an installation like it." And "Bloodless surgery." And "Cheiropractics." And the latest drug from Berlin, "brought over on purpose." And even the exploits of the foreign "Professors" who have a special attraction for many patients because, not being British, they are thought to hold the keys of heaven and of hell in matters hygienic. In most of these excursions we catch sight of the cloven hoof, though the victims themselves elect to charge us with jealousy and ostracism. Credulity, like youth, must be served, and where the carcase is there will the vultures be gathered together. . . . .

Surgery and Endocrine Therapy.

Let me turn to things that really matter. I should like to speak of surgery, if I had time, since I do not agree with my distinguished friend, the President of the College, that even the *craft* of surgery has reached its zenith. Anyway, I am sure that he, too, believes that the *field* of helpful surgery is far from being exhausted. The assistance given to prompt and clean surgery by intravenous therapy and some allied measures is already revolutionising the treatment of shock, as this Society has recently heard during the presentation of the Buckston Browne prize essay. In the surgery of the sympathetic nervous system, of the thyroid gland, and in a number of other directions, the excursion is bold but already amply justified by results. I should also like to speak of endocrine therapy, and of the arrest of certain diseases in which there has been proved to be a loss of hormone control of metabolism, as in the affections associated with calcium dysfunction which formed the subject of Dr. Donald Hunter's recent demonstration to this Society. But all this would take much too long. I will deal only with two interesting and important excursions, and offer some comments upon them. They are the development of irradiation therapy, and the present position with regard to immuno-therapy.

X Rays and Radium.

The discovery of X rays in 1895, and the isolation of the rarer metals—and especially of radium—and their radiations between 1896 and 1901, placed in our hands therapeutic instruments of enormous value. X rays being first rendered available in practical fashion, their application in the treatment of disease preceded that of radium by several years, and until quite recently they constituted the more popular method of employing gamma rays therapeutically. Of late, however, the position has become reversed so much so that in several fields there seems a tendency to discount the value of X rays for purposes of treatment and to confine their usefulness to the field of diagnosis. This seems unfortunate seeing that, as it would appear, we had only just begun to explore the possibilities of X ray therapy at the time when radium therapy overtook the older method in sufficient space between the tufts, which should be wired to the framework—cemented bristles are a danger." He points out that dental floss and even the fine tooth-pick may find a place in the hygiene of the teeth, as proved by their scavenging results. But he points out that the public should receive instruction in using both these adjuvants and the tooth-brush itself, for lack of right methods may cause erosion of the enamel and, by irritating the gingivæ, lower the local resistance and thus hasten the onset of pyorrhœa alveolaris. How far this occurs frequently seems to be uncertain.

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* Presidential address to the Harveian Society of London on an. 14th.

CAUSES OF EXCLUSION FROM SCHOOL.

AN interesting analysis of the numbers of children absent permanently or for long and short periods from school is included in the annual report for 1930 of Dr. H. Leslie Cronk, medical officer of health for Hampshire. He says in an introductory note:—

The survey of the health of children attending elementary schools in Hampshire shows clearly enough their conditions as regards dental decay, defective eyesight and hearing, and such deformities and defects which are not sufficient to prevent a child attending school. This makes a very imperfect picture, and leaves out all the ailments which are sufficiently severe to keep a child from school, and also those seemingly trivial but really somewhat important ailments from which children recover, and which leave no distinct signs to an inspection at school later on. To obtain a truer view of what health the children of this county enjoy, these two classes of ailments need to be reviewed. These words are of general application, for surveys of this kind should form an essential part of the study of the health of the elementary school-children of any area.

In Hampshire there are 44,506 children on the school register, and the average attendance is 40,415—that is, the average number of absentees is 4091.

Group I.: 231 children were permanently excluded from school for the following causes: 81 mentally defective; 15 blind; 29 deaf; 14 epileptic; 5 tuberculous; 1 suffering from deformity, 1 from respiratory disease, 6 from other diseases. In these lists children from 5 to 16 are included; without counting those above 14, the numbers would be much smaller, especially for the blind, deaf, and epileptic; and, apart from these groups and the mentally defective, there would be only 23 children permanently excluded from school.

Group II.: 400 children were absent from school for over three months at a time, equivalent to an average loss of 165 days throughout a year. The causes were:—

Disease.	Cases.	Weeks lost.
Infectious diseases	66	1137
Debility	53	1037
Rheumatic conditions	48	1199
Diseases of respiratory tract ..	47	964
Suspected tuberculosis	36	1038
Injury	28	538
Skin diseases and ringworm ..	27	485
Ear disease and mastoiditis ..	18	398
Appendicitis	11	192
Eye diseases	8	177
Diseases of genito-urinary system ..	6	108
Other conditions	42	995

The figures for infectious diseases were affected by a severe epidemic of measles. The amount of absence for suspected tuberculosis is high. It is noted that these figures do not imply "a large incidence of clinical tuberculosis among children." As a preventive measure, a certain number of ailing children, contacts of tuberculous patients, are received for treatment.

Of the 48 children said to be suffering from rheumatic conditions, 18 were suffering from chorea, and 12 from heart disease. It would be interesting to know how far this loss of attendance would be reduced in an area where there was a fully orga rheumatic scheme. Dr. Cronk says that in the cases are so scattered that supervision by sp clinics appears impracticable. He believes that provision of a convalescent home where educat can be given might be useful and might sequelæ, but it would necessarily be costly. T cases of injury occur most in boys of 7 and 8, a f which is interesting in relation to the Safety F campaign. Ringworm accounts for a number long absences, owing to the lapse of time bef obtaining the treatment by X ray provided.

In *Group III.* (absences of one week to months; ages 11 to 14 inclusive) the feature is the loss of time due to respiratory diseases

The numbers of absentees in Groups II. and III. were notably lower in schools where milk was given, and in general the provision of milk markedly reduced the loss of school attendance.

THE PRESCRIPTION OF GLANDULAR PREPARATIONS.

THE failure to differentiate between fresh and desiccated gland in prescribing glandular remedies may lead to ineffective dosage. In a booklet on Glandular Products and Their Doses, Mr. H. W Paines, M.P.S., gives useful advice about this. For ten years he has been engaged solely in dealing with these preparations, and he finds that the confusion in th minds of practitioners is getting worse. Whe thyroid was first introduced the fresh gland from th sheep was given, minced, in its raw state. The fir clinical experiments having been made with fres gland, this scale of dosage was carried on whe tablets containing desiccated gland were introduce and these were prescribed in terms of the equivale amount of fresh gland. The alternative is to prescri them in terms of the actual preparation used. Inste of writing: Thyroid fresh gland gr. i, one may p scribe thyroid siccum, gr. 1/5; and in the opini of Mr. Paines this is greatly to be preferred. T five names in common use are thyroid, thyroid fr gland, thyroid gland, thyroid extract, and thyr siccum. Pharmacists often have difficulty in int preting what is meant by some of these, and unl the last is employed the patient may get five tir or one-fifth of the dose intended. Mr. Paines co monly finds tablets in use with a totally inadequ dosage, and he lays down the rule that all glandu products should be prescribed in terms of the gland only. At the end of his booklet, which obtainable from Messrs. Paines and Byrne, L 31, Southampton-street, London, W. 1, he give table showing the "minimal therapeutic dose" a number of glands and the usual maximal d employed. This table would be of more value if had eliminated those substances of which the th peutic value in any dose is quite unrecognised. does not offer comments on the activity of preparations, but this clearly varies within limits.

ERRATUM.—In an article on Early English I Jars, published in THE LANCET of Dec. 26th, p. 1 the word "*caudle* cups" was misprinted "ca cups."

NATIONAL COUNCIL FOR MENTAL HYGIENE. association with the Howard League for Penal Re this council has arranged a series of lecture-discussion the Psychologist's part in the Prevention and Treatme Crime. They will take place at the rooms of the Me Society of London, 11, Chandos-street, W., at 5.30 P.M Wednesdays from Feb. 10th to March 16th. The series start with a lecture by Mr. George Ives on Penal Met Past and Present, after which the next two speakers wi Dr. T. S. Good, on Crime and Mental Abnormality, Dr. E. B. Strauss on the Borderline Case. Tickets ma had at the doors or from the secretary of the Counc 78, Chandos House, Palmer-street, S.W.1.

uld be foolish to suppose that we have seen the its of the method of active immunisation. We y have missed the optimum possibilities of the thod by just a little, and we may one day hit on, or stumble upon, some modification of our sent techniques which will make all the difference tween the frequent failures which cause so many be frank disbelievers to-day, and such uniformity good results as will convince the most sceptical. e suggestion that better results might be obtained we took pains to bring the antigen into more mediate and direct contact with the tissues which the main site of infection is only now being lowed up.

A new chapter has been opened quite recently in nnexion with bacteriophages. Concerning these, work so far done, both in the laboratory and the bedside, is too meagre to call for detailed mment.

Chemotherapy.

Chemotherapy received a marked fillip with rlich's introduction of 606. Within a few years ere was scarcely any infection that had not been ated by the method. No doubt many lives were t in consequence, though it is probably true to y that in most of these instances recovery would t have occurred had the remedy not been used. -day we do not regard the drug, nor its more odern equivalents, as being directly germicidal, as rlich did, and we have found that its indirect rmicidal effect is limited to a somewhat narrow ld. We are also beginning to realise, having given the ideal of a *therapia sterilans magna,* that the travenous route is by no means necessary, and may times be inferior to the older route of the muscles. ut the success of 606 gave a general stimulus to e use of germicidal preparations in pyogenic fections. The use of perchloride of mercury was introduced, but its place was soon taken by less xic mercurial compounds such as the salicylate, d especially mercurochrome. In this substance the agulative property of mercurial salts is greatly duced, whereas penetration is aided by the introction of the aniline dye fluorescein. Though far om being an ideal blood antiseptic, it is perhaps e nearest approach to this that we at present ssess. The most sensitive tissue which it meets the course of its action is the kidney, and, since amage done to this organ is so apt to be permanent, e use of mercurochrome calls for the utmost care.

Specificity of Remedies.

Of late years we have seen a reaction against ne doctrine of specificity in the therapeusis of icrobic infections. This reaction has shown itself the field of bacteriotherapy and also in the field f chemotherapy. We have seen the introduction of rotein shock, and also of what not seldom—though his effect is perhaps not intended—results in chemical hock. Such treatments have their basis of reason the hypothesis that the mechanism of Immunity generic rather than particular, and that it may herefore be activated by the same stimulus though he disease be caused by quite different species of nfecting agents. Such a conception is fundamental, ut the evidence supporting it is at present too light to warrant its acceptance as a sound basis or a scheme of therapeusis in infective diseases enerally. As usual, it may possibly be found that he truth lies somewhere between the two extremes. f specificity and non-specificity. The supposition, or example, that a dose of staphylococcal antigen may so jostle the immunity mechanism—evidently a very elaborate affair—as to leave the patient somewhat better when a state of relative equilibrium is once more established, and that this may happen even when the infection is bacillary in origin: such supposition is not incompatible with the view that an additional, and perhaps more valuable, benefit is derived from such administration in cases in which the infection is homologous with the particular antigen used, in this case staphylococcal. Even the idea of a "provocative reaction" may not be so specific as is usually supposed. The danger lies in *assuming a simple interaction, or a single one, or a* direct one, when all the time it may be complex, multiple, and indirect. There can be no harm in exploiting these new remedies and these ideas to the full provided we keep an open mind as to the nature of the interaction, and, it may be added, provided we use forbearance in accepting the explanation that fits with our own preconceived ideas, and decline to consider other and alternative ideas.

But since we are dealing always with an organism which possesses defences of its own, it behoves us to be careful that our reputed remedies do not merely add to the load the patient has to carry, and thus put a drag upon his natural resistance to his disease. This is an age of hustle, and a lust for the royal road to recovery is everywhere apparent. We are prone to forget that, though we may hope to shorten the course of an infection by our intervention, the chance of our being able to substitute an entirely different set of interactions from those by which the tissues reassert their criterion of health is remote. I do not myself find it difficult to visualise a remedial agent which shall expedite the natural course of recovery from an infection. There would often appear to be a lag in this natural process which, quite conceivably, might be overcome by appropriate means. But this raises the question as to whether the patient possesses a reserve in his immunity mechanism which can be called up for our purpose. And it may well be that this is a matter varying considerably in different individuals.

We get hints of this being actually so. Though, like many other of their terms, the words "sthenic" and "asthenic," used by our teachers of some thirty years ago, lacked clear definition, they undoubtedly correspond with observed clinical pictures. And, as one man's meat is another man's poison, so, I suggest, the contents of a hypodermic syringe that are found to be tolerated, or even appreciated, by one patient, may be definitely harmful to another, and yet both may be stricken by the same infection. That a dose of X.Y.Z 42 "will often enable an influenza patient to resume work on the third day" (I quote the advertisement) is not a controvertible statement, because a lot of other remedial measures have exactly the same to their credit; and provided the attack is quite a mild one, these measures may not have included any drugs whatever. But that (to quote again) "there is definite clinical evidence that the effect of injecting X.Y.Z 42 in the early stages of influenza is to reduce by one-half the duration of the disease and its accompanying symptoms" is a matter which must be left to the members of this Society and other equally competent observers to decide, rather than to the makers of the drug.

Concerning another preparation which I will call Angelina (said to contain "specific antibody," which is exactly what it does not contain) in the treatment of pneumonia we read—and the popularity. It is only since the war that reliable and constant apparatus in X ray work have been developed. Accurate dosimetry, and especially the co-relation between physically measured and biological dosage, are, again, of quite recent development; so also is the technique for depth irradiation. It is clear, therefore, that the stage has only been set within the last few years for really accurate observations of the therapeutic value of X rays. A vast amount of ill-controlled work is being done in this sphere, and by practitioners who have not had the necessary training for the purpose. This cannot be in the public interest, and we welcome the institution of a diploma which, supposing it to be adequately safeguarded and of a high standard, will serve to guide the patient and his doctor in the direction of efficiency. As an example of inefficiency may be mentioned the treatment of carcinoma, other than surface lesions, by low voltages, the use of which, besides being ineffective, prejudices the approach for subsequent proper treatment. On the other hand, low voltages have their value in several other directions, and their limits of service, as in the case of high voltages, are still quite unknown.

In the case of radium, no less than in X rays, the technique of administration demands whole-time service. So specialised, indeed, has the work become in the case of these two therapeutic measures that it seems impracticable for the same person any longer to engage in both with any degree of efficiency. Nor is it likely that, in the case of X rays, the same person can, in the patient's best interest, undertake both their diagnostic and their therapeutic application.

The segregation of these two important methods of treatment must needs result in a certain lack of unanimity as to which of them is to be preferred in particular cases. The exponent of either method naturally tends to consider it the fitter of the two, since he gets better results with the familiar, than with the unfamiliar, technique. It therefore becomes a matter of considerable importance that the practitioner, who is directly responsible for the patient, should acquaint himself thoroughly with the possibilities of both methods, since his own judgment is likely to be called upon, more and more frequently, to decide which is the more likely to attain the result desired.

The recent boom in the treatment of inoperable—and in some instances of operable—neoplasms, led to a great demand for radium in this country. The demand was quickly met. It then became apparent that there were not enough trained workers to deal with the radium actually available, and we are to-day witnessing the anomaly of radium going abegging. This position will, however, adjust itself when, on the one hand, workers have become more expert and, on the other hand, when we have extended the list of diseases for which it is reasonable to try the remedy.

Meantime it is interesting to observe that a great deal more experience is required before even the experts are agreed as to the dosage, the frequency, and the field of irradiation, in the case both of radium and of X rays, and even in diseases for which both have been used as a routine method of treatment for several years. A good example of this fact is seen in leukæmia: are the best results obtained from large doses given infrequently, or from small doses given frequently, and should it be the spleen, or the bones, or the glands, or some neutral part or parts, or several of these, that should form the field of irradiation?

Serotherapy.

In the treatment of microbic infections we hav
seen the swing of the pendulum more than onc
between bacteriotherapy and chemotherapy. Th
introduction of the method of passive immunity b
means of antisera, and, later, of the method of acti
immunity by means of bacterial antigens, led to bi
hopes. In the latter instance, it must be admitte
it led to big business also. During 30 years' experi
ence of these methods there have been great di
appointments, and yet, here and there, stimulatin
successes. In the case of serum therapy it is possibl
by further research and trial along two direction
that some of the former hopes may be redeeme
(1) The first direction relates to the determination
different types of the infecting agent within a grou
and the preparation of type-sera for use in hom
logous infections. Efforts have already been ma
along this line in the case of the *pneumococcus* a
the meningococcus. In the even more important gro
of streptococci, though the difficulties are greater,
similar effort may yet be rewarded by good resul
(2) In a second direction hope springs afresh. It h
been held for a long time that the exotoxins produc
during culture were not of service in the preparati
of antisera in coccal infections. They were for t
most part carefully separated off from the bodies
the cocci, which alone were used for the immunisi
inoculations. The resulting serum was theref
described as bactericidal or bacteriolytic. It
been found more recently, however, that a mu
more potent serum results from the use of th
exotoxins together with the endotoxins. Th
newer exotoxin-sera are now on trial, and some
the results of their use, especially in acute and vi
lent infections by *Streptococcus pyogenes* (vel *hæm*
ticus), have been strikingly good. These sera, hav
been chiefly obtained by the use of streptococci fr
the throat in severe cases of scarlet fever, have b
somewhat unfortunately labelled "scarlatinal a
strep. sera." They are, however, quite as usefu
streptococcal infections other than in scarlet feve
they are in this disease itself.

Vaccines.

The "opsonic index" hypothesis gave a sembla
of reasonableness to vaccine therapy without wh
the early hopes entertained on its behalf wo
probably have dwindled much earlier. Now that
must regard the method as entirely empirical the
is free for fuller exploitation, and that it has certa
had in no small measure. But though we have sen
out to the tissues of the infected patient spe
antigen in divers ways—dead, living, "*detoxicat*
"sensitised"; as endoplasm, as ectoplasm; and
divers systems of dosage—minute doses frequentl
massive dose singly, and by all gradations and
various intervals; the very cases of infection
which we most need help seem to elude all t
processes. And yet it must be admitted that
and there the general methods at our disposal
combating pyogenic infection in individual c
seem to receive striking assistance from ant
therapy. To those of us who have formerly incl
strongly towards this method, consideration of
present position with regard to the treatment of
diseases as pulmonary tuberculosis, septic e
carditis, and staphylococcal pyæmia, for exan
must needs cause a feeling of discontent. For i
three of these diseases we rely to-day upon exa
those measures of a general, non-specific sort that
did a quarter of a century ago. *But here* agai

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The number of these substances that are to-day being used in combating infections is considerable, and increases almost weekly. They are for the most part complex bodies possessing very large molecules. Their use is by some based upon the hypothesis that the protective power of the plasma resides in a number of protein particles that circulate in this medium, and that these particles can be "condensed" or "dispersed" by the injection, intravenously or intramuscularly, of the chemical substances referred to. How much of this hypothesis is known, or understood, by the majority of those who employ these therapeutic agents is doubtful; perhaps such knowledge is not necessary; but the confidence of those of us who are as yet unconvinced of the efficacy of these remedies is not enhanced by the somewhat casual manner in which the typical devotee of this particular school speaks of his exploits: "I plugged him with X.Y.Z." . . . "I fired in Angelina." . . .

But given a little forbearance, and some commonsense, I think these remedies should by no means be condemned out of hand. What is more important, however, is that the physiologists should come to our rescue. Either there *are* particles in the blood plasma, or there are not; and, if there are, either they *are* "condensed" and they are "dispersed" by the injection of certain chemical substances, or they are not. I cannot find that anything is known with certainty about these fundamental things; and research into them seems urgently called for. At present the issue is confused, and perhaps the method is prejudiced, by the business enterprise of the manufacturer and by the ease with which he converts the busier and less sceptical members of the profession. If the syndicates who run these things really want to establish their remedies, let them set aside some of the money they are making to biological research. At present their extravagant claims have far outrun the flimsy basis of fact upon which they are based.

Progress of Therapeutics.

Medicine has been termed an "inexact science." And by some confusion of thought this old saw has by many been considered to represent a permanent state of affairs. But much in medicine that was inexact yesterday is exact to-day, and much that is inexact to-day will doubtless be exact to-morrow. And it is but to change the words rather than the facts if we say that what is empirical to-day will become rational to-morrow. In many things therapeusis lags behind pathology, but pathology should always be prepared to get an inspiration from therapeusis. It is right, because it is useful, that therapeusis should continue to push out its antennæ, in this and in that direction, hoping to feel new facts that even pathology has not found. These, if found, should be explored by pathology, so that the remedy chosen might have the three time-honoured cardinal merits for which every patient rightly pleads—it should cure safely, pleasantly, and swiftly.

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. *diphtheriæ* was isolated from 10 of these 15 cases, l nine of the cultures were toxigenic. This pre- minance of virulent cultures cannot be used as an gument that most of this group were cases rather in carriers. Because, although a few carriers of irulent diphtheria bacilli were discovered when abbing boys on entry, yet Case 6 was the only boy io had been more than a term at G.H.S. from which avirulent culture of *C. diphtheriæ* was obtained er September, 1929. Between this date and July, 31, 23 consecutive cultures of *C. diphtheriæ* isolated m the throat swabs of healthy boys were all xigenic.

Of the 13 negative Schick reactors (including case D) io got "official" diphtheria, eight (61 ± 8 per nt.) were originally Schick susceptible on entry, it had been "artificially" made Schick immune fore contracting their sore-throats. The other e were "naturally" Schick immune on entry. fty-seven per cent. of all the boys who joined G.H.S. ter the school had been immunised had positive hick reactions on entry. Therefore there was tle evidence as to whether "natural" or "artificial" hick immunes were the more susceptible to "official" phtheria.

As a group, the 15 cases of "official" diphtheria, hich were not notified, had no outstanding clinical haracteristics to distinguish them from those patients i whose sore-throats *C. diphtheriæ* could not be emonstrated. Hence, because no one can say for ertain whether or not any *individual* case of "official" iphtheria, which is not clinically diagnosable, is aused by the toxins of *C. diphtheriæ*, the question ay appear to be an academic quibble of no practical mportance. Nevertheless, the *group* phenomena, discussed in this paper, support the hypothesis hat many, if not the majority, of such cases of 'official" diphtheria are subjects whose coincident nfection with *C. diphtheriæ* has no ætiological relation with their sore-throat; while the remainder are very mild, but "real" diphtheria cases in subjects who are partially immune. If this hypothesis is true we are aced in practice with more or less of an impasse; because the majority of diphtheria cases will always be missed, unless the majority of all types of sore-throat are swabbed, irrespective of their clinical character. Or, put in another way, because, apart rom the text-book case, one type of sore-throat suggests diphtheria as much as another. This does not only apply to an institution such as G.H.S., because diphtheria carrier-rates, and sore-throat morbidities as high as those reported in this school, are by no means infrequent outside it.

INDIRECT EFFECT OF ACTIVE IMMUNISATION ON NOTIFICATION.

The experience of active immunisation at G.H.S. forces home the practical lesson that, provided a case is known to have an undoubted Schick negative reaction (not merely to have had a prophylactic course of inoculations), the throat swab can be discarded, and such sore-throats diagnosed and treated on their clinical face value. Thus, active immunisation by an indirect psychological action reduces the number of diphtheria notifications in two ways. First, the confidence produced by the knowledge the patient and all his contacts are Schick immune, prevents the physician from notifying any type of sore-throat as diphtheria, and sending him to a fever hospital merely on the safety-first principle. Thus the positive error in diagnosis is diminished. Secondly, the mild, indefinite, and transitory cases of "real" diphtheria, which admittedly sometimes occur in Schick immunes, will often be "missed" if the throat swab is not regularly used, or, if it is used, such cases may be classed wrongly as "diphtheria carriers with coincident sore-throats." In this way the negative error in diagnosis is increased. These were the indirect effects of active immunisation which Dr. Goodall[2] spotted in our first communication. We have tried hard this time to eliminate our conscious prejudice in favour of active immunisation, but of course we cannot remove any fraction of bias which may remain buried in our subconscious minds.

CONCLUSION.

To summarise, the extent of the reductions in diphtheria-rates which were observed in the 3⅔ years following, as compared with the 6⅓ years preceding, the active immunisation of G.H.S. are as follows:—

Notifications of diphtheria per annum	46	times	less.
Estimated "real" cases of diphtheria per annum	21	,,	,,
Discovered "official" cases of diphtheria per *annum*	9·8	,,	,,
Frequency of *C. diphtheriæ* in sore-throats ..	4·0	,,	,,
,, ,, ,, ,, in healthy boys ..	1·6	,,	,,
Morbidity of all sore-throats per annum ..	equal.		

We personally believe that the most important cause of all the above reductions was the immunisation of the school; but we expect that many medical men will prefer to adhere to what is perhaps the "common sense" view, that, for practical purposes, "KLB positive" plus a "sore-throat"—i.e., our "official" diphtheria is always "real" diphtheria (see definition in section 2). If we accept this hypothesis, we will have to admit that the continued maintenance of Schick immunity in 97 per cent. of the inhabitants of G.H.S. was, with certainty, only followed by a fourfold reduction in the incidence of "common sense" diphtheria. Nevertheless, even had no change taken place in the "clinical severity," or duration of the disease, this reduction was more than worth while from any point of view—medical, financial, or educational. But in our opinion (which of course must be biased), if the morbidity of diphtheria is only granted a fourfold reduction, the "clinical severity," which then becomes relatively far more important than morbidity, must have declined at least a hundredfold after active immunisation.

Our thanks are due to Surgeon-Commander T. C. Patterson, R.N., who, after February, 1930, was responsible for the technical immunology and bacteriology at G.H.S. Also to Dr. R. A. O'Brien, of the Wellcome Research Laboratories, who supplied the prophylactic agents used in G.H.S.

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Waking Hour of Hospital Patients.—The central public health committee of the London County Council have decided that, save in special circumstances, no patient in the Council's hospitals is to be awakened earlier than 6 A.M. Where, owing to insufficiency of staff, this rule does not yet apply, it will be put into operation as soon as circumstances permit.

some years, approximately the same as the average rate in G.H.S. prior to immunisation, Caiger and O'Brien's paper, if we interpret it correctly, would suggest that a non-diphtheritic sore-throat in a diphtheria carrier must be rare. This discrepancy between the "official" cases at G.H.S. and the "notified" cases which were sent to the London fever hospitals is perhaps caused by the excessive number of ordinary sore-throats which were swabbed at G.H.S.

In any event it is very evident, provided the error in the diagnosis of notified diphtheria is as high as the fever specialists think, that even if active immunisation should ever prove successful in completely eradicating "real" diphtheria from a community, it could not effect the 40 per cent. of false notifications. However, that part of the error in diagnosis, caused by notifying carriers with non-specific throats, would diminish if the carrier-rate is reduced as a result of active immunisation. One may note here that, although the average carrier-rate at G.H.S. fell after the immunisation of the school, yet the fall was largely caused by the disappearance of avirulent *C. diphtheriæ*. Large carrier-rates are nevertheless compatible with a fully immunised population. More than two years after G.H.S. was fully immunised, a sample of 93 healthy boys, the inhabitants of one dormitory, were swabbed, and eight cultures of toxigenic *C. diphtheriæ* were isolated from among them—an 8·6±2 per cent. virulent carrier-rate in a sub-group, all but one or two of whose members had negative Schick reactions. The fever specialists have demonstrated how the official notifications of diphtheria must form an inadequate index on which to judge the effect of any prophylactic scheme directed against diphtheria. It would seem that a better index would be the frequency of false clinical diagnoses among the cases sent to the fever hospitals as diphtheria. When this frequency approached 100 per cent. we could feel certain the preventive measure was a success.

It is a curious paradox that the more careful a physician is to exclude (*sic*) diphtheria by swabbing sore-throats which are not clinically diagnosable, the greater may be his error in diagnosis, though he will, of course, miss fewer cases of "real" diphtheria.

DIPHTHERIA IN SCHICK IMMUNES.

The high degree of immunity to severe clinical diphtheria which is exhibited by Schick immunes has been discussed elsewhere.[4] Suffice it to say that Park,[5] whose experience is unrivalled, says he has never seen an undoubted case of diphtheria in a subject possessing an undoubted negative Schick reaction; and our limited experience at G.H.S. is in agreement with this dictum, as the subjoined Table of the 19 "official" diphtheria cases which were discovered after the immunisation of G.H.S. shows. In this table the four "definite" cases, which were the only ones notified, are lettered A to D. A, B, and C were new entries who contracted diphtheria before being inoculated. A and B had positive Schick tests which remained positive after their return to school until they were artificially immunised. Case C was sent to hospital with jaundice before he was Schick tested, and developed diphtheria while in hospital. On his return to G.H.S. his Schick test and throat swab were both negative. Case D deserves special mention as the only boy with a negative Schick test who was notified as diphtheria.

This patient reported sick on March 8th, 1931, with an indefinite sore-throat. On March 10th there was a large greyish patch of membranous exudation on the right tonsil. Temperature was 100·4° F. He was sent to the fever hospital, and virulent bacilli were recovered from a throat swab taken at G.H.S. He was perhaps not an undoubted case of diphtheria, but he was the negative Schick reactor who most resembled it. Moreover, this subject had had four consecutive positive Schick tests, and five inoculations of full strength toxoid, before his fifth Schick test in October, 1930, was negative, about eight months after his joining school, and five months prior to the onset of symptoms. His Schick test, on return from hospital in May, 1931, was still negative.

With three doses of the diphtheria antigen as used on this case over 95 per cent. of any natural group of Schick susceptibles should acquire Schick immunity within three months, which suggests such subjects as Case D, who are exceptionally refractory to artificial active immunisation, are especially susceptible to clinical diphtheria.

Table of "Official" Diphtheria Cases Discovered after the Active Immunisation of G.H.S.

Case reference.	Date of onset of sore-throat.	Months at school before illness.	Schick test on entry.	Prophylactic inoculations.	Last Schick test before illness.	Virulent (V) or Avirulent (A) *C. diphtheriæ.*	Clinical diagnosis of diphtheria.
A	June /28	0	+	0	+	V	Def.
1	Oct. /28	5	−	0	−	V	Indef.
2	Oct. /28	11	−	0	−	V	"
3	Jan. /29	8	+	2	−	V	"
4	Apl. /29	3	+	1	+	V	Neg
5	Oct. /29	32	+	1	−	?	Indef.
6	Dec. /29	26	+	3	−	A	Neg.
B	Jan /30	0	+	0	+	V	Def.
7	Feb. /30	24	−	0	−	?	Indef.
8	Mar. /30	11	+	3	−	V	Neg
9	Apl. /30	1	+	3	+	V	Indef
10	July /30	2	−	0	−	V	"
11	July /30	1	+	2	+	V	Neg.
12	Sept./30	9	+	2	−	?	"
13	Oct. /30	24	+	2	−	V	"
C	Nov. /30	0	?	0	?	?	Def.
D	Mar. /31	13	+	5	−	V	"
14	May /31	4	−	0	−	?	Indef
15	May /31	13	+	2	−	?	Neg

A-D, "notified" cases; 1–15, cases not recorded as diphtheri
? = "unknown"; def. = definite; neg. = negative.

We will now consider the 15 "official" cases
diphtheria, but which were neither notified n
recorded as diphtheria in the school records. Eig
of these patients have been classed as having
"indefinite" clinical diagnosis. On clinical groun
only, the probability of their being "real" diphthe
was small, unless a large proportion of the 326 so
throats, in which the swab was negative, were al
diphtheria. The remaining seven cases, labell
"negative," had injected catarrhal sore-throats a
no sign of any membranous exudation. They we
less like diphtheria than dozens of other patie
who had "negative" throat swabs. None of th
15 boys were really ill, and in all cases the sympto
cleared up in a day or two. They were, howev
kept under observation till their throat swabs w
"negative." Cases 9, 11, and 13 "carried" virule
bacilli for over two months. It was the invaria
rule at G.H.S. that any case which had more th
trivial symptoms, suspicious of diphtheria, was gi
antitoxin without awaiting the laboratory repo
Only Case 1 in this group received any diphthe
antitoxin, which is perhaps the best indication of th
clinical resemblance to diphtheria. Cases 4, 9, and
got "official" diphtheria during their prophylac
course. Their Schick reactions were positive 1,
and 21 days respectively before the onset of th
sore-throats. In each case another Schick te
about a month after the onset of the sore-thro

oming a career in itself. Treatment of this dition is difficult, as the patient has usually been an apprehensive nature since early childhood. ifiscation of the thermometer and an attempt remove some of the more obvious fears by per-sion may help, but a change in the patients umstances which forces him to be more dependent his own efforts and resources may be more successful. Banister[2] has rightly emphasised the fact t the unduly ego-centric make poor patients as is these who may become the valetudinarian ld-lags" known to every sanatorium. This centration on self interferes with sleep and prevents patient from getting that mental and physical t which is so essential for recovery.

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Projection is another phenomenon which is commonly observed in the tuberculous patient; it appears in the form of a morbid interest in other people's disease. The majority of sanatorium patients think nearly all the others are worse than themselves, and not a few derive consolation from the worse plight of the more severe case. Such a patient puts the blame, if he fails to improve, on doctors, climate, food, in fact on anything but himself.

The rebel type.—When a person of this type of mentality gets tuberculosis he makes a difficult problem for the physician, as the attitude he adopts against authority makes him regard any unorthodox remedy as necessarily more efficacious than the methods of treatment generally accepted by the medical profession. It is among these unfortunates that the "persecuted" quack has his most happy hunting ground. A frank admission of the smallness of our knowledge and the magnitude of our ignorance may help to gain the confidence of such a patient; at worst it will rob him of his favourite theme that all doctors are humbugs who claim omniscience.

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This discussion of the mental aspects of tubercle would not be complete without some reference to the difference between the home and the sanatorium atmosphere. The disadvantage of the former is that the patient is constantly reminded of his physical inferiority by being surrounded by healthy and solicitous relatives. The anxiety of his family may suggest to him that he is worse than is actually the case; on the other hand it may drive him to prove by over-compensation that he is really quite well. Many patients, who require strict rest, find it impossible to allow themselves to be waited on by elderly or more physically feeble relatives. Although the sanatorium provides a more healthy atmosphere in these respects, it is common to find patients who do not easily adapt themselves to an institutional

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IN the treatment of tuberculosis, healthy living is all-important, other remedies being no more than adjuvants, and in themselves useless to stay the progress of the disease if the mode of life is unhealthy. Since the course of the illness is invariably long much depends on the condition of the patient's mind, which must be such as would enable him to make a consistent effort towards recovery. It seems at first sight that there should be no great difficulty in carrying out so simple a régime as that described in the dictum, rest, fresh air, and good food; none the less it is common knowledge that many people with tuberculosis have not the endurance to carry out this mode of life for a sufficient period, and a large proportion of them throw away their lives as the result of this failure to adapt themselves to a suitable environment.

If the tuberculosis physician could learn so to influence the minds of his patients that they acquired a proper attitude towards the disease, the greatest therapeutic advance of the century would have been achieved.

Sound therapy can only be based on a proper understanding of pathology, and it is therefore necessary in the first place to study as fully as possible the mental states observed in persons with tuberculous disease. This problem is a vast one, as people of every type of mental make-up are liable to fall victims to tubercle, and in the present state of knowledge it is possible to attempt only a somewhat sketchy review of the subject.

ÆTIOLOGY.

That the resistance to tubercle and other diseases may be lowered as the result of a severe psychic trauma has long been admitted. More recently much has been written concerning the psychological "flight into disease." It is certainly not uncommon to meet with patients, especially in tuberculous families, who show many of the symptoms of phthisis but in whom physical and radiological signs are consistently absent. It is probable that many of these are suffering from purely psychological phthisis. Groddeck in his delightfully stimulating book "The Unknown Self" elaborates the theory that the organism deliberately makes use of a germ to attain its own ends. Although the results of experimental and accidental inoculation make it impossible to accept this theory in its entirety, there is much truth in it, and few will dispute the modified statement that illness is likely to follow when all desire for life and health have gone. The importance of the mind in the ætiology of consumption was clearly recognised by the late Arthur Latham who said [1] in 1917:

> "The increase of tuberculosis during the war could not be explained by increased infectivity, but could be explained by the increased strain and stress. We could only remove the disease by removing the strain and stress of working people; until this were done the result would be as unsatisfactory as at the present time."

In this connexion it is not out of place to point out that a strong case has been made for the psychic origin of such diseases as exophthalmic goitre and epilepsy which were long considered as purely organic.

Although, as has been said, any type of person may get tubercle, there does appear to be a particularly high incidence on those of outstanding intelligence, and the victims of the disease include a large number of men and women of genius. From this observation has arisen the idea that the toxin of tubercle stimulates creative capacity. This theory does not bear close examination, and it seems much more probable that the intensity of feeling and thought required for creative work, so often allied to an acute sensitiveness and vulnerability towards the inevitable harshness of a workaday world, make the genius a particularly easy victim to such a disease as tuberculosis. Dilke, shortly after the death of Keats, wrote: "Thought was intense with him and seemed at times to assume a reality that influenced his conduct and I have no doubt helped to wear him out." Such people have great difficulty in adapting themselves to their surroundings.

REACTION TO DIAGNOSIS.

It is a common observation that when the onset of tubercle is dramatic, for example by a profuse hæmoptysis, steady progress towards recovery is often made. With less conclusive proof of the presence of serious disease the attitude of the patient is apt to be incredulous; he shrinks from facing unpleasant facts, and will take any loophole for disputing the accuracy of the diagnosis. Medical men are the worst offenders in this respect, and I have met with arguments designed to prove that the acid-fast organism abundantly present in the sputum was not the tubercl bacillus. Even when convinced of the presence of th disease the majority of patients are outwardl confident that they will be quite well in three month or some equally unreasonable time. This attitud is in strange contrast with that of a man when one his friends is sent to a sanatorium, for in this case is usual to meet with a gloomy view, based on childhoo memories of the usual fate of "consumptives" ar on the excessively low rate of recovery from phthis in works of fiction. The opposite type of reaction which the patient shows extreme shock and fear also common, but tends to be of shorter durati and thus of less consequence. Interesting cases a met with in which both incredulity and terror a present, first one and then the other dominating t scene.

DURING TREATMENT.

The patient who shows a proper combination courage and caution, adaptability to a new enviro ment, and the capacity to form fresh interests when t old ones are inadvisable, has a good prospect recovery even when the disease is of moderate severi Unfortunately, it is only a small minority who a of this type from the start, but a considerable numb learn to adjust themselves after the first few months treatment.

There are many points of similarity between t tubercle and the war neuroses. Underlying both the fear of death and the resulting conditions m be looked on as the reactions of individuals of vary mental make-up to this all-pervading emoti The specialised form of slangy speech with which t soldier attempted to keep away his fears, is clos comparable to that of the tuberculosis patient w must refer to a refill as a "blow-up" and the repla ment of an oleothorax as "emptying the sump."

Anxiety.—Many patients are obviously appreh sive throughout the disease; unduly meticulous the conduct of their cure, they may record th temperatures almost hourly and regulate their li with stop-watch precision. Trivial symptoms treated with great seriousness and the self-cent condition, produced by the constant preoccupati with routine, results in the treatment of the dise oming a career in itself. Treatment of this dition is difficult, as the patient has usually been an apprehensive nature since early childhood. fiscation of the thermometer and an attempt remove some of the more obvious fears by persion may help, but a change in the patients umstances which forces him to be more dependent his own efforts and resources may be more successful.

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Although, as has been said, any type of person may get tubercle, there does appear to be a particularly high incidence on those of outstanding intelligence, and the victims of the disease include a large numb- of men and women of genius. From this observation has arisen the idea that the toxin of tubercle stimulates creative capacity. This theory does not bear close examination, and it seems much more probable that the intensity of feeling and thought required for creative work, so often allied to an acute sensitiveness and vulnerability towards the inevitable harshness of a workaday world, make the genius a particularly easy victim to such a disease as tuberculosis. Dilke, shortly after the death of Keats, wrote: "Thought was intense with him and seemed at times to assume a reality that influenced his conduct and I have no doubt helped to wear him out." Such people have great difficulty in adapting themselves to their surroundings.

REACTION TO DIAGNOSIS.

It is a common observation that when the onset of tubercle is dramatic, for example by a profuse hæmoptysis, steady progress towards recovery is often made. With less conclusive proof of the presence of serious disease the attitude of the patient is apt to be incredulous; he shrinks from facing unpleasant facts, and will take any loophole for disputing the accuracy of the diagnosis. Medical men are the worst offenders in this respect, and I have met with arguments designed to prove that the acid-fast organism abundantly present in the sputum was not the tubercle bacillus. Even when convinced of the presence of the disease the majority of patients are outwardly confident that they will be quite well in three months or some equally unreasonable time. This attitude is in strange contrast with that of a man when one of his friends is sent to a sanatorium, for in this case i is usual to meet with a gloomy view, based on childhoo memories of the usual fate of "consumptives" an on the excessively low rate of recovery from phthisi in works of fiction. The opposite type of reaction i which the patient shows extreme shock and fear i also common, but tends to be of shorter duratio and thus of less consequence. Interesting cases a met with in which both incredulity and terror a present, first one and then the other dominating th scene.

DURING TREATMENT.

The patient who shows a proper combination courage and caution, adaptability to a new environ ment, and the capacity to form fresh interests when th old ones are inadvisable, has a good prospect recovery even when the disease is of moderate severit Unfortunately, it is only a small minority who a of this type from the start, but a considerable numb learn to adjust themselves after the first few months treatment.

There are many points of similarity between t tubercle and the war neuroses. Underlying both the fear of death and the resulting conditions mu be looked on as the reactions of individuals of varyi mental make-up to this all-pervading emotio The specialised form of slangy speech with which t soldier attempted to keep away his fears, is close comparable to that of the tuberculosis patient w must refer to a refill as a "blow-up" and the replac ment of an oleothorax as "emptying the sump."

Anxiety.—Many patients are obviously apprehe sive throughout the disease; unduly meticulous the conduct of their cure, they may record th temperatures almost hourly and regulate their li with stop-watch precision. Trivial symptoms a treated with great seriousness and the self-centr condition, produced by the constant preoccupati with routine, results in the treatment of the disea stion of age in relation to improvement in both ances. The cases were for this purpose divided four groups: (1) Up to 29 years, (2) 30 to 39 rs, (3) 40 to 49 years, and (4) over 50 years. These ups were then considered as to whether they wed great improvement, improvement, slight rovement; no improvement, or deterioration. ing into account the smallness of the figures en so subdivided, no significant difference appears the various age-groups of either series. One refore came to the conclusion that age differences ween the two groups could justifiably be disarded.

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[1] THE LANCET, 1917, ii., 792.

he duration of the disease was then considered. e cases in both series were divided into three ups as follows: (1) those with a history of under year; (2) those with a history of from one to years; (3) those with a history of over five years. ey were classified in the same manner as the age ups. In both series a slight drop in improvement s noted as the time since the onset of the disease gthened. This is a factor which has a bearing the comparison, as there were 50 per cent. of tients with a history of over five years in the nonccine treated and only 15 per cent. in the other oup.

The *condition on admission* was considered thirdly, d here again it is obvious that the series are not ogether alike. Unfortunately this particular was ly available in a proportion of the cases, so allowce has had to be made for the size of the figures. e results of this part of the inquiry are summarised Table III., which shows that 48 per cent. of the ccine treated cases were showing some degree of provement on admission, whereas in the nonccine treated the corresponding figure was only per cent.

TABLE I.—VACCINE-TREATED CASES.

CONDITION ON DISCHARGE.

The following symbols have been used throughout: ++ Great improvement, + Improvement, ± Slight improveent, 0 No improvement, — Worse.

	++	+	±	0	—	Total.	Total improved.
	106	159	40	25	1	331	305
er ent.	32	48	12	8	—	100	92

Table I. shows the condition of the 330 vaccinereated cases on discharge. It is seen that 92 per cent. ave made improvement of some degree or another. t is not intended to draw any conclusions from igures such as these, which may be so very greatly nfluenced by personal opinion, but they are included o furnish a possible comparison with the results of ther workers.

Table II.A shows the summary of the replies to he post-cards, and must be taken simply for what t is worth. It represents solely the patients' opinion f the progress made or of the course of the disease. nasmuch as other information, such as return to work nd so on, was often volunteered, it is not without alue, and is, in the circumstances, the only evidence f the sort that can be obtained. The degree of mprovement was not asked for, but was given in a umber of cases.

The list of patients that did not reply was examined, and it was found that the proportion that had improved, remained stationary, or got worse while in hospital was about the same as in the list which replied. It therefore seemed probable that the series under consideration represented a fair sample, and that its selection was not influenced by other factors than chance.

Table II.B shows the subsequent improvement in the 550 non-vaccine treated cases, the total admitting any degree of improvement being 43 per cent.

TABLE II.—SUBSEQUENT CONDITION.

A.—VACCINE TREATED.

	++	+	±	0	—	Total.	Total improved.
	51	76	39	58	49	273	166
Per cent.	19	28	14	21	18	100	61

B.—NON-VACCINE TREATED.

	++	+	±	0	—	Total.	Total improved.
	27	143	64	175	141	550	234
Per cent.	5	26	12	32	25	100	43

TABLE III.—CONDITION OF PATIENTS ON ADMISSION.

A.—VACCINE TREATED.

	+	±	0	—	Total.	Total improving.
	81	8	34	65	188	89
Per cent.	43	5	18	34	100	48

B.—NON-VACCINE TREATED.

	+	±	0	—	Total.	Total improving.
	57	9	31	104	210	66
Per cent.	28	5	16	51	100	33

COMMENT ON THE DATA.

A comparison of these tables (II.A and II.B) shows that 61 per cent. of the vaccine-treated cases have made some degree of improvement, whereas in the non-vaccine treated group the total is only 43 per cent., a possible difference of 18 per cent. in favour of vaccine treatment.

If, however, this is considered with the figures showing the condition on admission (Table III.), it is seen that the difference is more apparent than real. As has been mentioned, 48 per cent. of the vaccine-treated patients stated that they were improving before admission, so that the absolute total improved was 61 per cent.—48 per cent.=13 per cent. In the non-vaccine treated 33 per cent. stated that they were improving before admission, so that in this case the absolute total was 43 per cent.—33 per cent.=10 per cent.

The real difference between the two series therefore seems to be represented by 13 per cent.—10 per cent. =3 per cent.—a difference which is not significant when taking into account the size of the figures. Even if there were a slight significant difference it is probable that it would be accounted for by the fact that the vaccine-treated cases had on the average a much shorter history. It is considered that the figures in Tables II. and III. are strictly comparable, atmosphere; although most of these settle down in a few days or weeks there are a few who cannot do so. It is interesting to note in this connexion that a recent example of this form of claustrophobia admitted that he had twice run away from school.

THE NEO-HIPPOCRATIC OUTLOOK.

The recent great advance in biochemical and physical knowledge has focused attention on that approach to the problems of disease by which all vital activity will ultimately be reduced to the interaction of various groups of atoms and electrons. Great as has been the gain of medical science and philosophy from this work, it has brought with it the danger that the reactions of the organism as a whole may be overlooked. Of all morbid conditions, tuberculosis is the one in which it is most essential to treat the patient rather than the disease. Specific remedies, although useful in many cases, are no more than adjuvants to general hygienic treatment aimed at "raising the resistance." In this struggle between health and disease the mind plays an important part, and I believe that further understanding of the mechanism by which the mind responds to the stimulus of the disease would enable more rational and effective treatment to be applied.

VACCINE TREATMENT IN INFECTIVE ARTHRITIS.

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Opinion on vaccine therapy in rheumatic diseases has for some time been in a state of flux. The theory of focal infection as an ætiological factor held out a promise from this form of treatment which few will now admit to have been entirely fulfilled. Nevertheless, there is a fairly substantial opinion that vaccine treatment is not without its value, and it seems therefore that a critical survey of a recent series may be of interest.

The literature of vaccine therapy in rheumatic diseases is in a most unsatisfactory condition, although reports of "good results" are not lacking. In many cases the numbers are inadequate, in others the diagnosis is vague or the number of unsuccessful cases is not stated, and the figures have rarely been considered with a view to determining how far any differences may be due to the factor of chance. The only way in which anything approaching proof can be obtained is to compare, in as many ways as possible, the results of treatment in two large series, in which the conditions are as much the same as may be.

It is desirable: (1) that the inquiry should be confined to one clinical entity; (2) that a control series of adequate size should be provided; (3) that every attempt should be made to minimise the personal factor; (4) that the intermittent character of the symptoms should be taken into account; and (5) that the factor of chance variation should be allowed for.

It must be admitted that only certain of these desiderata have been attainable. The inquiry has easily been limited to cases of infective arthritis only, and differences less than those possibly due to chance variation have been disregarded. The provision of a suitable control series has, however, been more difficult. The ideal method would of course have been to withhold all other forms of treatment from half the patients and to treat the other ha with vaccines. This, particularly on the large sca that would be necessary, is impossible. I have ha therefore, to be content with comparing two seri both treated in various ways, in one of which vaccin have been given. The series themselves are no identical, but where they differ an attempt has bee made to allow for the difference. The fact tha natural variations of symptoms tend to occur ha been partly dealt with by a consideration of th progress on returning home, and a comparison o this with the clinical condition of the patient o admission. Great care was taken that all case should be typical, and as there was no shortage o material, all doubtful cases were excluded.

The following criteria were used in the selectio of cases: (1) That the affection should have bee more or less continuous since its onset. (2) That should be polyarticular. (3) That at least one sm joint should be affected. (4) That the radiologi and laboratory findings, where present, should be agreement with the clinical diagnosis.

TECHNIQUE OF VACCINE THERAPY.

The stock vaccine was freshly prepared each y from about forty strains isolated from the teeth or from infective arthritis. The autogenous vacci were usually prepared from the same sources occasionally from other suspected foci.

The organisms were grown in 1 per cent. glucose nutr broth (pH 7·5) and produced a fairly abundant growt 24–48 hours. They we in 0·5 per cent. phenol i by heating in the wate standardisation by comparison with a tube containi 0·5 per cent. suspension of barium sulphate in w Sterility tests were made, and were left up for at least days before the vaccine was considered ready for use.

The vaccines were given subcutaneously just unde clavicle, at intervals usually of three or four days, sometimes weekly. The reaction was always allowe subside completely before giving another dose. The dose was as a rule in the neighbourhood of 5–10 mi The number of doses given to each patient was se more than twelve, and the average was eight. The pat in this, as in the non-vaccine treated group, receiv addition balneological and other forms of physical treat during their stay in hospital.

THE INQUIRY.

At the beginning of last year (1930) each pa who had received treatment in the period Jan 1928, to December, 1929, was requested to fill up return to the hospital a post-card stating whethe condition had (1) improved, (2) remained the s or (3) got worse, since returning home. No card was sent to a patient who had not been at l for at least three months. The majority had at home for very much longer, in fact for pe varying up to nearly two years. About 80 per of the cards were returned, and it was thus pos to get some idea of the late results of treatm at least from a subjective point of view.

It is well, in making a comparison of this des tion, to examine both series minutely with a to determining how nearly they are alike in particular except the essential one. As has mentioned, both groups of cases were treated in years 1928 and 1929, both received general t ment, and in both the sex distribution was rou about the same.

The *average age*, however, was definitely high the non-vaccine treated group, well over one- of the cases being over 50 years of age, where the other series this was the smallest group o It was therefore thought advisable to conside roof is, indeed, upon one who assumes a case to strate multiplicity of primary malignant tumours, there are so many possibilities of error in obser on and interpretation that one should approach subject with extreme reserve, and that only after fully considering the possibility of metastasis or lantation.

t is highly improbable that cases of multiple intra cal carcinomata can be explained away as examples netastasis, for. though epithelioma of the tongue ws an almost constant invasion of the lymphatic ids, secondary deposits elsewhere are extremely . Moreover, if these multiple tumours were the ilt of metastasis, we should expect to find secondary wths in other parts of the body as well.

ver 250 years ago, with only the knowledge and row views of his day, Tulpius, the Dutch anatomist, of the principal figures in Rembrandt's master e, "The Anatomist," said: "Cancer is just as con ious as inflammation of the eyes." Doubtless this in exaggerated statement, but there has accumu d much clinical and experimental proof that cancer ccasionally communicated from host to host or n one part of the body to another. Among the st striking examples are those showing the spread cancer of one side of the vulva to the other. n Bergmann[6] recorded a case of a man with a cer of the lower lip and exactly opposite to it on upper lip was a similar growth, and Macewen[7] s of a man with an epitheliomatous ulcer of his lip o had contracted the habit of rubbing the ulcer l then the tip of his nose with the same finger. enty months after the removal of the growth on lip, he returned with a large ulcer on the tip of the nose identical microscopically with the original tumour. Shimmelbusch[8] reported a similar case of apparent cancerous infection of the lip through the finger-nails of a person with an epithelioma of his ear.

There appears to be no doubt that implantation carcinoma of the mucosa of the alimentary canal has occurred on many occasions and that traumatised tissues are an especially fertile bed for this development. Hoche[9] has reported an epithelioma arising in the centre of a gastric ulcer in a patient with carcinoma of the œsophagus, and Dowden,[10] Challier,[11] among others, have described cases of implantation arising in colostomies from carcinoma of the large bowel. The development of carcinoma in the tooth-sockets in the case I have reported would seem without doubt to be another example of auto-inoculation or implantation and it would be illogical to invoke a different explanation of the origin of the carcinoma on the left tonsil in the same case. Probably many of the other cases of so-called multiple primary carcinomata of the buccal cavity are in reality examples of cancerous implantation.

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CLINICAL AND LABORATORY NOTES

CASE OF ENTERO-MESENTERIC CYST

SIMULATING ACUTE RETENTION OF URINE

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ENTERO-MESENTERIC cysts often give the symptoms d signs of various acute abdominal conditions such acute appendicitis, intussusception, volvulus, or testinal obstruction, but we cannot find any record it simulating a case of acute retention of urine. e failure to pass urine, together with the presence a swelling in the abdomen having the shape and nsistency of a large palpable bladder but which at eration was found to be an intraperitoneal cyst, nder this case an unusually interesting one.

REPORT OF CASE.

Past history.—The mother stated that the boy had always een a delicate child and had often complained of tenderness the lower part of the abdomen, with vague abdominal mptoms. He had an attack of "catarrhal jaundice" hen aged 6, and 18 months ago was in bed for several onths with acute rheumatism. He was also admitted to spital in February, 1929, with a provisional diagnosis of testinal obstruction. The hospital notes of that time state at he had a history of continual vomiting of green fluid r a week with constipation. He appeared very ill, had a nken look on admission, with sordes on his lips. On xamination of the abdomen no peristalsis was observed, was doughy to palpation, no tumour was felt, but free uid was present. Paracentesis abdominis was performed and a straw-coloured fluid withdrawn. The pathological report stated that no tubercle bacilli were detected, cells were present, mainly small lymphocytes and endothelial cells. The culture was sterile. The constipation was treated, condition subsided, and patient was sent to a convalescent home some weeks later with a final diagnosis of tuberculous peritonitis. An interesting point bearing on his subsequent history was the fact that during his stay in hospital the patient had considerable difficulty in passing urine, and his foreskin was slit in an attempt to remedy this.

History of present attack.—The patient, now aged 8, was admitted to hospital on June 6th, 1931, with the diagnosis of acute retention of urine. A day before admission the boy returned from school in a collapsed state, was giddy, faint, and complained of pains in his abdomen. He was given an aperient and bowels were freely opened. He did not micturate that day, was very parched, drank freely, and was very restless during the night owing to the abdominal pain. He vomited that night and twice in the morning. On admission to hospital the patient was pale, thin, dull, and toxic, with a coated dry tongue. Temperature, 100·4° F.; pulse-rate, 100; respiration, 22. The abdomen was rigid, and a hard tender swelling was palpated in the mid-line reaching to half an inch below the umbilicus. There was free fluid in the flanks. The respiratory and central nervous systems were normal. A rubber catheter was passed without difficulty but no more than 4 ounces of urine was collected. Later another catheter was passed, but this time no urine came through. A catheter was passed under general anæsthesia in the theatre, but again no urine was withdrawn.

Operation.—A right paramedian incision was made. On opening the peritoneum free yellow fluid was found, and a large, fairly thin-walled intraperitoneal cyst was exposed. The cyst was the size and shape of a large coco-nut, was smooth, and had a pale greenish appearance. It was continuous with, and attached to the mesentery of the small intestine, near its fixation to the posterior abdominal wall, and was fairly mobile on its attachment. The attachment was broad with myxomatous appearance, and the small gut in one portion (about 1½ inches) was attached to it. The cyst was aspirated and some yellow fluid evacuated. It was then incised, and yellow jelly-like material was expressed. The inner lining of the cyst was very red and œdematous.

as both the statement as to condition on admission and the reply to the post-card represent the patient's point of view.

It is, of course, a fallacy that the post-cards were all sent out at the same time—that is, at greatly varying intervals after discharge, but as this was the same in both series the comparison still holds good. It was noted that there was no evidence of greater benefit in 92 patients who received autogenous vaccines than in the vaccine-treated group as a whole.

The conclusion is therefore that, within the limits of the inquiry, vaccines do not appear to hold out any better prospect of improvement or cure of infective arthritis than the other methods of treatment in use.

MULTIPLE MALIGNANT GROWTHS OF THE BUCCAL CAVITY.

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Lord Moynihan's clinical note on a Case of Primary Carcinoma developing, at intervals, in three different parts of the buccal cavity (The Lancet, Jan. 2nd) and his *statement that he has "never before seen two* primary malignant growths in the mouth" prompts me to report the following case.

On March 16th, 1931, a man, aged 62, was admitted into the David Lewis Northern Hospital, Liverpool. He complained that for three months he had been troubled by "soreness of his gums" on the left side. His mouth was edentulous and on the left side there was an epitheliomatous ulcer involving the floor of the mouth and the alveolus. The epithelioma was some two and a half inches long and extended back on to the fauces. The tongue could only be protruded half an inch beyond the gums and deviated to the left. The Wassermann reaction was negative. No involvement of the glands could be detected.

The growth was treated with surface application of radium on a plaque and when he was seen a month later the mouth seemed to be normal, the ulcer had healed up, and the induration of the floor of the mouth had gone. In July, however, he returned, complaining of severe pain in his left ear. On examination marked induration and thickening was found posteriorly in the angle between the tongue, the mandible, and the fauces. Radium was again applied. He returned for examination at intervals and appeared to be progressing well. The induration and the earache disappeared.

On Nov. 26th he came up for routine re-examination. He said he had come for his discharge as he had no pain and was sure he was cured. When I asked to see his mouth he protruded his tongue fully one and a half inches and deviated it well over to the right side so that I could examine the left side of his mouth. There was no sign of any recurrence of malignant disease on the left side. No glandular enlargement could be felt on the left side but, to my surprise, I found a hard mass of glands in the right submaxillary region and on the floor of the mouth, on the right side anteriorly, just under the tongue was the cause of this—a small indurated and ulcerated plaque, one centimetre in diameter. This plaque presented all the characteristics of an epithelioma. The patient was quite unconscious and even incredulous of this new development and at first refused to undergo further treatment. Later he consented to come into hospital and radium needles were inserted into the epithelioma and into the cervical glands.

In The Lancet of Oct. 26th, 1929, p. 873, I reported a case of Implantation of Epithelioma in the Alveoli of the Maxilla from primary growth in tongue which show similar features to Lord Moynihan's case. The main features of this case were as follows:—

A man aged 50 years. A very large epitheliomatous ulcer on right side of the tongue extending back on to right palato-glossal fold was excised with diathermy two weeks after the first and second right upper molars had been extracted. Ten weeks later he returned for re-examination and it was found that, though the tongue had completely healed and there was no sign of a local recurrence, three new and discrete growths had appeared. On the left tonsil there was an epitheliomatous ulcer, half an inch in diameter, which spread on to the soft palate but did not involve the tongue or the anterior pillar of the fauces. The sockets of the extracted molars were filled with fungating masses of epithelioma which though contiguous were quite distinct from one another. All of these growths were excised with diathermy cautery When the man died three months later, there was no sign of any recurrence in the mouth.

OTHER REPORTED CASES.

Spencer and Cade[1] report five similar examples:

(1) Male, aged 71. Four separate growths on the palate.

(2) Male, aged 53. A patient of Butlin who had four discrete epitheliomas on the border and under surface of the tongue and floor of the mouth as well as a rodent ulcer at the inner canthus of the eye.

(3) Female, aged 74. A papillary epithelioma on the left margin of the tongue, followed three months later by an epitheliomatous ulcer on the right lateral margin.

(4) Male, aged 57. Epithelioma involving the right lateral margin of the tongue and adjoining portion of the floor of the mouth and alveolus, followed three months later by an epithelioma developing on the soft palate.

(5) Male, aged 62. A papillary carcinoma on the left lateral margin of the tongue and an epitheliomatous ulcer on the right palato-glossal fold.

Fraser[2] in an investigation of 105 cases of buccal carcinoma found five cases of multiple primary growths. In one of these, however, the first growth to appear was a rodent ulcer of the left nostril. The other four cases were as follows: (1) Epithelioma of lower lip followed 14 years later by an epithelioma on the right palato-glossal fold. (2) Epithelioma of lower lip followed 14 years later by an epithelioma on the left palato-glossal fold. (3) Epithelioma of lower lip followed seven months later by an epithelioma on buccal surface of right cheek. (4) Epithelioma of left lateral margin of tongue followed eight years later by an epithelioma on the right lateral margin.

L. T. Owen[3] in a review of 3000 cases of malignant tumours found only two examples of multiple intra buccal growths—namely, (1) epithelioma of floor o mouth apparently cured but followed seven year later by an epithelioma on the alveolus; (2) a epithelioma on the right margin of the tongue followe three years later by an epithelioma on the left borde

PRIMARY OR SECONDARY?

These examples seem to suggest that cases such a Lord Moynihan's, though uncommon, occur mor frequently than is generally supposed.

Are the lesions multiple primary tumours or a they produced by metastasis or implantation Billroth[4] emphasised the importance of the criteri used as a basis for diagnosis and established thes postulates which he *felt* were necessary for the diagnosis of multiple malignant neoplasms:—

(1) Each tumour must have an independent histolog appearance. (2) The tumours must arise in different situ tions. (3) Each tumour must produce its own metastasis.

Mercanton[5] suggested the addition of a fourt postulate—namely, no recurrence of the tumou after their removal.

It seems to be as unreasonable to demand the fu fillment of the third and fourth postulates in t diagnosis of multiple primary carcinomata as it wou be in the diagnosis of a single carcinoma, a insistence on Billroth's first postulate would put o of court all the cases that I have quoted.

We may consider that Billroth's criteria are unnece sarily stringent, but in view of the general and we founded clinical conception of cancer as a conditi arising from a single focus of *origin* but acquiri multiple secondary foci of development, the burd

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E HOUSE PHYSICIAN, ST. OLAVE'S HOSPITAL, ROTHERHITHE;
AND
L. Wells, M.R.C.S. Eng.,
RESIDENT MEDICAL OFFICER, ST. OLAVE'S HOSPITAL.

NTERO-MESENTERIC cysts often give the symptoms
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REPORT OF CASE.

Past history.—The mother stated that the boy had always
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History of present attack.—The patient, now aged 8, was admitted to hospital on June 6th, 1931, with the diagnosis of acute retention of urine. A day before admission the boy returned from school in a collapsed state, was giddy, faint, and complained of pains in his abdomen. He was given an aperient and bowels were freely opened. He did not micturate that day, was very parched, drank freely, and was very restless during the night owing to the abdominal pain. He vomited that night and twice in the morning. On admission to hospital the patient was pale, thin, dull, and toxic, with a coated dry tongue. Temperature, 100·4° F.; pulse-rate, 100; respiration, 22. The abdomen was rigid, and a hard tender swelling was palpated in the mid-line reaching to half an inch below the umbilicus. There was free fluid in the flanks. The respiratory and central nervous systems were normal. A rubber catheter was passed without difficulty but no more than 4 ounces of urine was collected. Later another catheter was passed, but this time no urine came through. A catheter was passed under general anæsthesia in the theatre, but again no urine was withdrawn.

Operation.—A right paramedian incision was made. On opening the peritoneum free yellow fluid was found, and a large, fairly thin-walled intraperitoneal cyst was exposed. The cyst was the size and shape of a large coco-nut, was smooth, and had a pale greenish appearance. It was continuous with, and attached to the mesentery of the small intestine, near its fixation to the posterior abdominal wall, and was fairly mobile on its attachment. The attachment was broad with myxomatous appearance, and the small gut in one portion (about 1½ inches) was attached to it. The cyst was aspirated and some yellow fluid evacuated. It was then incised, and yellow jelly-like material was expressed. The inner lining of the cyst was very red and œdematous.

represent the patient's point of view.

It is, of course, a fallacy that the post-cards were all sent out at the same time—that is, at greatly varying intervals after discharge, but as this was the same in both series the comparison still holds good. It was noted that there was no evidence of greater benefit in 92 patients who received autogenous vaccines than in the vaccine-treated group as a whole.

The conclusion is therefore that, within the limits of the inquiry, vaccines do not appear to hold out any better prospect of improvement or cure of infective arthritis than the other methods of treatment in use.

MULTIPLE MALIGNANT GROWTHS OF THE BUCCAL CAVITY.

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ASSISTANT HON. SURGEON TO THE NORTHERN HOSPITAL, LIVERPOOL; HON. SURGEON TO THE GENERAL HOSPITAL, BIRKENHEAD.

Lord Moynihan's clinical note on a Case of Primary Carcinoma developing, at intervals, in three different parts of the buccal cavity (The Lancet, Jan. 2nd) and his statement that he has "never before seen two primary malignant growths in the mouth" prompts me to report the following case.

On March 16th, 1931, a man. aged 62, was admitted into the David Lewis Northern Hospital, Liverpool. He complained that for three months he had been troubled by "soreness of his gums" on the left side. His mouth was edentulous and on the left side there was an epitheliomatous ulcer involving the floor of the mouth and the alveolus. The epithelioma was some two and a half inches long and extended back on to the fauces. The tongue could only be protruded half an inch beyond the gums and deviated to the left. The Wassermann reaction was negative. No involvement of the glands could be detected.

The growth was treated with surface application of radium on a plaque and when he was seen a month later the mouth seemed to be normal, the ulcer had healed up, and the induration of the floor of the mouth had gone. In July, however, he returned, complaining of severe pain in his left ear. On examination marked induration and thickening was found posteriorly in the angle between the tongue, the mandible, and the fauces. Radium was again applied. He returned for examination at intervals and appeared to be progressing well. The induration and the earache disappeared.

On Nov. 26th he came up for routine re-examination. He said he had come for his discharge as he had no pain and was sure he was cured. When I asked to see his mouth he protruded his tongue fully one and a half inches and deviated it well over to the right side so that I could examine the left side of his mouth. There was no sign of any recurrence of malignant disease on the left side. No glandular enlargement could be felt on the left side but, to my surprise, I found a hard mass of glands in the right submaxillary region and on the floor of the mouth, on the right side anteriorly, just under the tongue was the cause of this—a small indurated and ulcerated plaque, one centimetre in diameter. This plaque presented all the characteristics of an epithelioma. The patient was quite unconscious and even incredulous of this new development and at first refused to undergo further treatment. Later he consented to come into hospital and radium needles were inserted into the epithelioma and into the cervical glands.

In The Lancet of Oct. 26th, 1929, p. 873, I reported a case of Implantation of Epithelioma in the Alveoli of the Maxilla from primary growth in tongue which show similar features to Lord Moynihan's case. The main features of this case were as follows :—

A man aged 50 years. A very large epitheliomatous ulcer on right side of the tongue extending back on to right palato-glossal fold was excised with diathermy two weeks after the first and second right upper molars had been extracted. Ten weeks later he returned for re-examination and it was found though the tongue had completely healed an no sign of a local recurrence, three new and discr had appeared. On the left tonsil there was a matous ulcer, half an inch in diameter, which sp the soft palate but did not involve the tongue or t pillar of the fauces. The sockets of the extract were filled with fungating masses of epitheli though contiguous were quite distinct from on All of these growths were excised with diatherm When the man died three months later, there w of any recurrence in the mouth.

OTHER REPORTED CASES.

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These examples seem to suggest that cases suc Lord Moynihan's, though uncommon, occur frequently than is generally supposed.

Are the lesions multiple primary tumours or they produced by metastasis or implantati Billroth[4] emphasised the importance of the crit used as a basis for diagnosis and established th postulates which he felt were necessary for the di nosis of multiple malignant neoplasms :—

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It seems to be as unreasonable to demand the fu fillment of the third and fourth postulates in t diagnosis of multiple primary carcinomata as it wou be in the diagnosis of a single carcinoma, an insistence on Billroth's first postulate would put ou of court all the cases that I have quoted.

We may consider that Billroth's criteria are unnece sarily stringent, but in view of the general and wel founded clinical conception of cancer as a conditio arising from a single focus of origin but acquirin multiple secondary foci of development, the burde

f is. indeed. upon one who assumes a case to
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ject with extreme reserve. and that only after
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highly improbable that cases of multiple intra-
carcinomata can be explained away as examples
astasis. for. though epithelioma of the tongue
an almost constant invasion of the lymphatic
secondary deposits elsewhere are extremely
Moreover, if these multiple tumours were the
f metastasis. we should expect to find secondary
s in other parts of the body as well.

250 years ago. with only the knowledge and
views of his day. Tulpius. the Dutch anatomist.
the principal figures in Rembrandt's master-
"The Anatomist," said: "Cancer is just as con-
as inflammation of the eyes." Doubtless this
xaggerated statement. but there has accumu-
uch clinical and experimental proof that cancer
sionally communicated from host to host or
ne part of the body to another. Among the
triking examples are those showing the spread
cer of one side of the vulva to the other.
ergmann[6] recorded a case of a man with a
of the lower lip and exactly opposite to it on
per lip was a similar growth. and Macewen[7]
a man with an epitheliomatous ulcer of his lip
ad contracted the habit of rubbing the ulcer
en the tip of his nose with the same finger.
y months after the removal of the growth on
, he returned with a large ulcer on the tip of the nose identical microscopically with the original tumour. Shimmelbusch[8] reported a similar case of apparent cancerous infection of the lip through the finger-nails of a person with an epithelioma of his ear.

There appears to be no doubt that implantation carcinoma of the mucosa of the alimentary canal has occurred on many occasions and that traumatised tissues are an especially fertile bed for this development. Hoche[9] has reported an epithelioma arising in the centre of a gastric ulcer in a patient with carcinoma of the œsophagus. and Dowden.[10] Challier,[11] among others, have described cases of implantation arising in colostomies from carcinoma of the large bowel. The development of carcinoma in the tooth-sockets in the case I have reported would seem without doubt to be another example of auto-inoculation or implantation and it would be illogical to invoke a different explanation of the origin of the carcinoma on the left tonsil in the same case. Probably many of the other cases of so-called multiple primary carcinomata of the buccal cavity are in reality examples of cancerous implantation.

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CLINICAL AND LABORATORY NOTES

ASE OF ENTERO-MESENTERIC CYST

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The growth was treated with surface application of radium on a plaque and when he was seen a month later the mouth seemed to be normal, the ulcer had healed up, and the induration of the floor of the mouth had gone. In July, however, he returned, complaining of severe pain in his left ear. On examination marked induration and thickening was found posteriorly in the angle between the tongue, the mandible, and the fauces. Radium was again applied. He returned for examination at intervals and appeared to be progressing well. The induration and the earache disappeared.

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OTHER REPORTED CASES.

Spencer and Cade[1] report five similar examples:

(1) Male, aged 71. Four separate growths on the palate.

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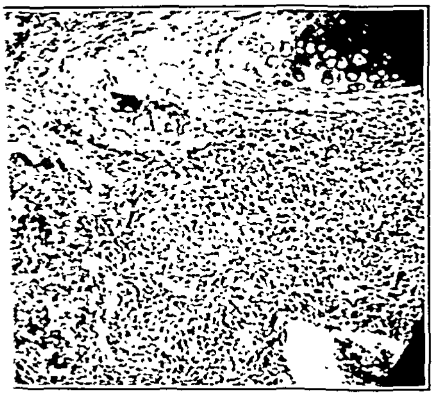
l other parts normal.

MICROSCOPICAL EXAMINATION.

The abdominal glands show extensive areas ɔnomatous tissue in the cellular stage (Fig 2). .c glands show similar changes but are more pigmented.

ections through the right main bronchus show ɔf the mucosa by lymphadenomatous granulation

FIG. 3.



ıotograph showing lymphadenomatous granulation rating the mucosa of a small bronchus. Part of and cartilage can be seen, also some mucous

many typical Sternberg giant cells. Sections maller bronchial tubes leading to the part of the the region of the abscess show partial blocking by similar infiltration of the mucous membrane Fig. 3. No lymphadenomatous tissue can be the wall of the lung abscess. The nodule in ɔe is a lymphadenomatous deposit. The mass nsists of fibrous and cellular lymphadenomatous g which a few newly formed bile capillaries

ıse the patient's symptoms on admission ly pulmonary and remained so until re the end. Moreover, the nature of the symptoms—viz., those of a pyopneumo- ɔne not often associated with Hodgkin's were there any symptoms or signs of the detected in any other part of the body, ɔf the results of accessory examinations. s no doubt that in this case the trouble he deep-seated lymph glands, whether ıbdominal or both it is not possible to be ıistory only dates from about three months ssion.

back from the vantage point of the seems probable that the pain in the back pressure on the left ureter from the lominal glands, whilst the list of repeated everishness fits in with the existence of ma. Actually, however, after admission, up to the time of the onset of acute few days before death, there was nothing be felt in the abdomen, nor were there any eferable to it. The spleen was never s the pneumothorax increased the liver down and its edge felt below the costal it seemed normal.

orax is not a common accompaniment of lymphadenoma. R. I. Köttler[1] in 1930, when recording such a case, states that, "from available literature" it would appear that "his case is unique." So far as we have had the opportunity of making a review, we have found no other reference to its occurrence. On the other hand, it is not uncommon for lymphadenomatous changes to be found in the lungs; and although E. Kaufmann[2] states that such changes are often seen along the bronchi and arteries, we regard the pneumothorax as an accident following a more or less fortuitous chain of circumstances. In our case the lymphadenomatous infiltration of the mucosa of certain small bronchi probably caused some obstruction of the lumina, as was indicated by the diminished movements and expansion seen clinically; hence, retained secretion and secondary infection producing the abscess. This doubtless ruptured at some time into the pleura, although at autopsy no actual communication was found. The microscopic sections show that the abscess in the lung was not due to the breaking down of lymphadenomatous tissue.

Köttler's case was that of a woman, aged 23, and the duration of illness was eight months. There was weakness, fever, and wasting, and later enlarged glands in neck and axilla. She had cough, dyspnœa, and right pleurisy. The spleen was just palpable later. Ten days before death serous fluid was drawn off from right pleura and an unsuspected pneumothorax found. At autopsy a large tracheal gland was found to have broken down and formed a fistula into the œsophagus. In the upper part of the right lung were confluent foci of breaking-down material, which in one place had joined together and left a cavity the size of a walnut, with a hole (1 by 2 cm.) into the pleura. He regards this as a secondary infection of the lung in a case of Hodgkin's disease.

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[1] Zeit. f. Tuberk., 1930, lviii., 37.

[2] Lehrbuch d. Spezieller Pathologischen Anatomie, 1922, Berlin, p. 205.

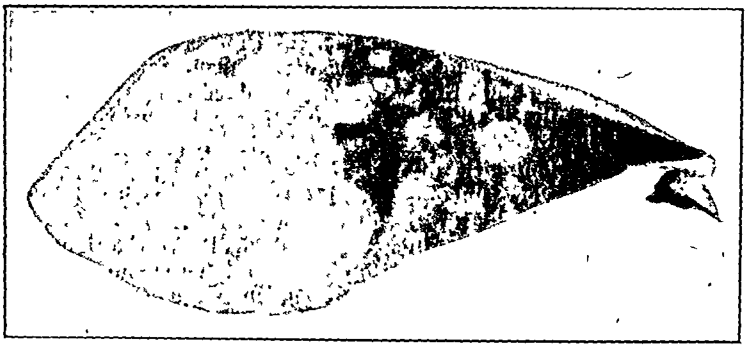
STAFFORDSHIRE POOR-LAW INSTITUTIONS.—The Staffordshire public assistance committee has prepared plans and estimates for the reorganisation of hospital accommodation which involve the expenditure of £243,000. It is proposed to convert the Newcastle institution into a hospital of 400 beds for the northern part of the county, and to do the same with the Wordsley institution for the southern portion. The estimated cost of the Newcastle scheme is £175,000, and of the Wordsley scheme £68,000.

WAKEFIELD FEVER HOSPITAL.—The city council are not proceeding with a suggested scheme for the erection of a new hospital at a cost of £71,000, but will improve and extend the existing one, upon which the medical officer, Dr. T. Gibson, has made a strongly unfavourable report. He condemns the present site on several grounds. It is on the smoke-laden side of the town, is increasingly surrounded by houses, the main ward pavilions are within a few feet of a public road, involving noise amounting at times to a nuisance. The windows are broken by stone-throwing from without, and there is sometimes undesirable communication between patients and outsiders. Dr. Gibson finds that the hospital does not lend itself satisfactorily to extension, and that it is not suitable for the treatment of cases of tuberculosis. There are 24 beds instead of the 60 at least that are necessary for ordinary infectious diseases. The ventilation is "quite inadequate," the hot water supply "very poor," and the gas lighting "miserable." This insufficient lighting is sometimes "a positive danger," as when a tracheotomy operation has to be performed in the middle of the night. At times more than one disease has had to be treated in one ward; there are no side wards for septic cases or dying patients, and "operations have to be performed in the wards, surrounded by screens." Dr. Gibson adds that "were it not for an adaptable and competent nursing staff public confidence in the hospital would have been shattered long ago."

all this time. She was then up and about again but still feeling very ill.

Two weeks before admission the weakness became worse and she developed a cough and sore-throat. She also complained of a stabbing pain in the right side, which was made worse by coughing or taking a deep breath; it was so severe that it made her "scream out." Her breathing has also been "heavy." This stabbing pain lasted for about a week.

FIG. 1.



Photograph to show the tumour-like mass in the liver.

On May 18th a needle had been put into the right chest but no fluid was obtained.

The personal and family history gave no information of importance. Her general functions are normal except that the menses ceased in January, 1931, for the first time. They had always been regular before.

Examination (May 25th).—A small spare woman propped up in bed. Respiration-rate 40, with obvious distress; temperature, 102° F.; pulse-rate, 152. Full examination showed no abnormal signs in the nervous system, no superficial glandular enlargement, no changes in the limbs. Nothing abnormal to be seen or felt in the abdomen; the spleen was not palpable. The abnormal conditions were apparently quite limited to the thorax. The heart was in its normal position; no murmurs were present. Chest expansion was much diminished. The chest was poorly developed. Rhonchi were heard here and there over both lungs. Movement was diminished on the right side, and at the right base there was complete dullness with absence of breath sounds. No tubercle bacilli were found in the sputa.

Course of Illness.—During the next few days she remained much the same, the temperature ranging each day from normal to 102° F. The respirations came down to 28, and the pulse-rate varied from 120 to 130. There was a trace of albumin in the urine. She complained of more pain in the right chest, cough, and shortness of breath.

Radiography on May 30th showed restricted movement of the right diaphragm. The heart small; normal in position. Partial collapse of the right lung, and an area of pneumothorax occupying the costophrenic angle. Marked fibrosis extending from the right hilum towards the base. This was evidently the beginning of the pneumothorax, for when the patient was last examined there had been no signs of it.

During the next few days her condition became worse—the temperature began to swing more, the pneumothorax increased rapidly, and signs of some fluid appeared at the right base. The mediastinum and heart were displaced to the left. On June 5th a second radiogram confirmed these findings. On June 6th the chest was punctured by the medical registrar, Dr. T. E. Gumpert. It was found that there was a negative pressure −2 to −6: 270 c.cm. of air was injected to restore a pressure of zero (−3 : +3).

A blood count on June 3rd showed: red cells, 3,700,000; hæmoglobin, 35 per cent.; white cells, 11,400; platelets, 250,000. Of the leucocytes 95 per cent. were polymorphs, with many young forms. No eosinophils seen.

On June 11th, 270 c.cm. of streptococcal pus were removed. Again the pressure before doing this was −2 : −8 : and was afterwards brought to zero (−2 +2) by replacement of 250 c.cm. of air. After this her condition improved somewhat. Blood cultures were negative. Repeated examinations showed no change in the physical signs. There was a large pneumothorax on the right side with a small quantity of movable dullness at the base. The temperature remained about the same as before. The liver edge was about two inches below the costal margin; it was smooth and apparently normal. The spleen was not palpable. There were no abnormal physical signs in parts. No petechiæ. No cardiac murmurs.

On July 6th she vomited after taking her morn of medicine and complained during the day of l appetite. Later in the day she began suddenly with pain in the abdomen. On examination the abdom distended, rigid, and very tender—more on the righ than the left. It was evic

and after

Simpson,

pulmonary condition present, o interference did not offer any lik of benefit. She died on July 9th autopsy was performed on the fol day.

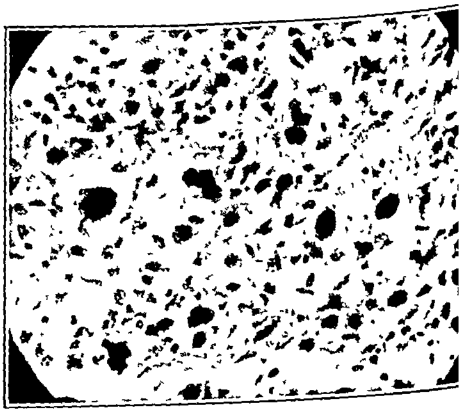
AUTOPSY.

Externally.—Slight œdema of l extremities.

Thorax.—Pyopneumothorax in pleural cavity, with several pints from which hæmolytic strepto obtained in pure culture. Dense adhesions in left pleural cavity. displaced to left side, but otherwise Much frothy secretion in the air The mucosa of the lower end of the has a slightly granular surface. The main bronchus shows thickening mucous membrane with a flat protuberance not obviously ulcerat 5 mm. in diameter, situated a q an inch from the bifurcation of the Around the bronchus and extendi its branches into the lung is considerable fi right lung is collapsed, with thickened pleura a genic membrane on the surface. In the lower part upper lobe, just under the surface, is an abscess of a cherry, but with no obvious leakage of pus pleura. At the base of the lower lobe is a firm solid about as large as a pea. The left lung is very œdema and there is bronchitis. The glands at the root of the l are enlarged, reaching a maximum of about one in diameter. The smaller ones are discrete, but the larg heavily pigmented and surrounded by fibrous tissue, adh to the right bronchus.

Abdomen.—General purulent peritonitis, hæm streptococci isolated in pure culture. The sto intestines, pancreas, and suprarenals are normal. liver weighs 48 oz. The anterior margin appears n

FIG. 2.



High-power photograph of a section from one of t abdominal glands.

On the under surface of the left lobe is a protruding, like mass of whitish material, exceedingly tough to cu two inches in diameter, with numerous satellites (Fig. 1). This mass can be traced along the bile-du the right lobe. There are several small flat nodules ing slightly from the superior surface. The splee is slightly enlarged and soft, but otherwise appears Masses of enlarged glands are to be seen along th borde

down

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considerable difficulties. Coward and Burn had shown by using large numbers of animals that as the amount of œstrin injected was increased, an increasing number of rats or mice showed œstrus. It had therefore become necessary to carry out standardisation on large numbers of animals and all previous quantitative work had been rendered useless. The point where 50 animals showed œstrus and 50 did not had, by common consent among workers, become the standard for œstrin. Other variations in the effectiveness of a dose were produced by the purity of the material and by the mode of administration. Very pure œstrin was excreted so rapidly that it was gone before œstrus occurred; larger doses were required for oral administration than for injection, and far fewer units were required for oral administration of crude œstrin than of the pure material. Furthermore, the activity of a quantity depended on the number of doses into which it was divided. Very little was known of the nature of the prolans except that they were complicated substances containing nitrogen.

Turning to the clinical application of this research Prof. Dodds said that œstrin had been recommended for every gynæcological condition—amenorrhœa, menorrhagia, hæmophilia, and a host of other conditions. The prolans had been similarly recommended. The expense of progestin, due to the difficulty of obtaining corpora lutea, was an obstacle to its clinical use. Probably all work in the past had been carried out grossly inadequate doses. He suggested that should be confined to clear-cut cases about which ch is known and that large doses of œstrin should o given. It should be possible to make preparations which would be slowly absorbed; large doses of crystalline material appeared to be wasteful and useless. The Aschheim-Zondek test for pregnancy was the only definite clinical aid that had so far come from this work. In conclusion, he offered a warning with regard to the indiscriminate use of prolan. It was known that the ovary of an animal could be converted into a solid mass of lutein tissue by the administration of this material and it would be undesirable to run any risk of producing this effect in women.

UNITS OF DOSAGE.

Prof. A. S. **Parkes** said that standard units as a measure of œstrus-producing hormone did not exist, but it would be possible to standardise the œstrus-producing hormone within 10 per cent. by the method of Coward and Burn. The test depended on the cornification of the vagina of a mouse or rat; in these animals the amount required to produce the cornification varied with the method of administration, the time over which it was spread, and the number of doses into which the material was split. Disregarding for the moment these large variations, the laboratory unit was a rat unit or a mouse unit. By keeping strictly to the same method with these two animals Prof. Dodds and Mr. G. F. Marrian, D.Sc., had shown that the dose required for rats was ten times that for mice. Cornification was only one symptom of œstrus and the amount of hormone required to produce full œstrus, judged by distension of the uterus, was found to be very much greater. Marrian had found that the necessary dose was about 200 times greater in the mouse and it was likely that a similar factor held for the rat. In larger animals the figures were still more startling. To produce œstrus in the ovariectomised ferret or rabbit the figures mounted rapidly into thousands and 100,000 mouse units were required to produce full œstrus in a baboon weighing 10 kg. The dosage was thus found strictly on a weight for weight basis, and so co the curve upwards the clinical dose becam million mouse units for a woman. Various preparations were on the market, one of wh 30*s*. for 2000 units. If half a million un necessary for a woman and this figure were m by 12½, the factor for oral administration, the one effective dose would be £9000. The rea dosage for clinical use was a very urgent and a revision of our ideas of the clinical tion of the œstrus-producing hormone was required.

CLINICAL TESTS.

Dr. H. **Gardiner-Hill** said that he ha provided by Prof. Dodds with standardised e of œstrin for four years. This material ha tried out on cases of amenorrhœa and of clin phenomena. He had classified the cases into t (1) primary amenorrhœa (normal individual delayed development, wasting diseases, and gla defects), (2) primary menstrual irregularities, were minor degrees of the first group, a secondary amenorrhœa. None of group 1, third of group 2; and in group 3 over half the of secondary amenorrhœa due to simple cause as climate, shock, or pregnancy had been af Secondary amenorrhœa due to glandular defec been unaffected. Two cases were striking; patients complained of amenorrhœa and ste both menstruated after injection of 180 and mouse units respectively, became pregnant an normal children. Dr. Gardiner-Hill thought preparations of œstrin such as those provide Prof. Dodds were worth further clinical trial in fully selected straightforward cases of amenor of the type he had discussed. He realised difficulty of assessing clinical results in these c tions, but nevertheless thought that it was di to account for the changes in his cases except o supposition that they had in some way resulted treatment with œstrin. When the relative size o human being and the experimental animals taken into consideration the effective dose cer seemed to be small, but the œstrus-producing in animals mentioned by Parkes appeared t quantitative. Could not the clinical result explained on the "trigger" hypothesis of W. Sh a small dose stimulating a sub-functioning foll apparatus to produce active follicles and so initi the cycle which ultimately resulted in the men discharge?

CHEMICAL CONSTITUTION.

Dr. Marrian said that in 1927 Aschheim and Zo discovered the presence of œstrus-producing hor in urine. The next step was in 1928 when I showed that the œstrus-producing hormone had acidic properties of a phenol. This gave the which led to the isolation by three indepen workers of a crystalline material with an empi formula of $C_{18}H_{22}O_2$. It proved to be a hydr ketone. A little later Dr. Marrian himself isolated an œstrus-producing compound with formula $C_{18}H_{24}O_3$ with three hydroxyl gro Butenandt had then shown that both these substa were present in the urine of pregnant women, that one could be converted into the other distillation with potassium sulphate; they therefore obviously related chemically. The of these ($C_{18}H_{22}O_2$) was more potent physiologic than the second, and a distinction should be en the substances when mention was made of s-producing hormone. The ketone gave its num response 24 hours after injection, whereas ritrodroxyl compound gave a longer latent l and a much more prolonged response. Dr. an suggested that further work should be cted by using injections of the crystalline ial only in order to obtain clear-cut results.

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TUBERCULOSIS ASSOCIATION.

AT a meeting of the Tuberculosis Association on Jan. 15th a discussion took place on the

Psychotherapeutic Treatment of Tuberculous Patients.

Dr. S. VERE PEARSON, opening the discussion, said that he, in dealing with smaller numbers of patients than many of the physicians present, probably had the advantage of being able to devote more individual attention to the patients under his care; and hence it was probable that his patients were more frequently able to unburden their troubles and worries than would be possible in larger institutions. This mere unburdening was often of definite therapeutic value, and anything like psycho-analysis was very seldom necessary. All experienced sanatorium physicians knew how important it was to have a constant stream of mental encouragement playing upon the mind of the patient, this, in conjunction with good environment and proper treatment of the physical condition, being usually sufficient to bring about satisfactory improvement. In considering the pathogenesis of tuberculosis he believed that too much emphasis was laid upon infection by the tubercle bacillus and too little upon the psychological influences involved. In order to get a patient well they had to take into account all the ætiological factors concerned. It was necessary to recognise all the conditions which had wrought a "discord of the elements within the body," otherwise harmony and health could not be brought about. A realisation of these factors was equally necessary for diagnosis, prognosis, and treatment. Unless the psychological condition of a patient was taken into account, mistakes in diagnosis were bound to occur. It had been said that "phthisis *always* had an origin in discouragement," and although this might be only partially true they had to remember the possibility of a "psychological flight into illness." It was important for the physician in charge of a case at least to bear in mind the possibility of pulmonary tuberculosis not being the cause of the lapse from health, or of its being only one of the causes and perhaps, even in a case with markedly abnormal physical signs in the chest, one of comparatively minor importance.

The Mind in Tubercle.

Dr. ANDREW MORLAND (Mundesley Sanatorium) followed with a paper on this subject, which is published in full on p. 176 of this issue.

Dr. LEONARD F. BROWNE, dealing with the psychotherapeutic treatment of tuberculous patients, pointed out that tuberculosis being a chronic disease should be viewed from the psychotherapeutic aspect just as in the case of any other chronic toxic disease. While psychotherapy could not supersede physical treatment, it could reinforce it admirably in certain directions. The patient's attitude to life would make an enormous difference to his powers of resistance. Upon admission to the sanatorium some routine psychological examination should be made, so that the physician might get a picture of the type of personality with which he was dealing. Information as to the patient's heredity and family environment should be acquired. Reaction to former illnesses was of importance, and full particulars should be obtained of the patient's sexual history, attention being paid to any indications of arrested or warped development. The question of anxiety should be gone into, and inquiry made as to the patient's ability to adjust difficulties in his environment. In the very first interview the doctor would have the opportunity of establishing that relationship with the patient which was so valuable a therapeutic asset. The importance of the personal factor was being more and more recognised in industry, in politics, and in international relations. It was no less important in the sanatorium, and the personality of the physician played a large part in the treatment of the disease. In the long treatment which tuberculosis so often required, the relations between the doctor and his patient became very intimate. There was probably no disease which called for higher personal qualities in the medical man who treated it than tuberculosis. A strong personality, wide sympathy and understanding, approachableness, infinite tact and discretion, a willingness to discuss problems, and a sense of humour were essential qualities in dealing with the varied temperaments and mental outlook of patients suffering from this disease. The method of suggestion or persuasion was of value in dealing with the general attitude of the patient to his disease and in overcoming certain troublesome symptoms which might arise during its course, such as insomnia, cough, or anorexia. In other cases, however, patients suffering from such conditions as anxiety states or conversion hysteria—which might in themselves have paved the way for the tuberculous infection—would require analytical treatment, although it would always be a question whether any given case was suitable to undergo the strain of analysis, and the advantage of mental improvement would have to be weighed against the possibility of physical deterioration. In conclusion the speaker emphasised the importance of treating the personality of the patient. His individuality should never be lost sight of; his mental attitude should be studied and taken into account in the doctor's dealings with him. It would be an immense help for the staff of every sanatorium to include a physician with some knowledge of psychotherapy so that special treatment could be provided when necessary. In any case, for any doctor dealing with tuberculous patients a knowledge of the mental mechanisms would enable him to deal with the patient's reactions on the spot and incidentally would greatly increase the interest of his work.

WEST LONDON MEDICO-CHIRURGICAL SOCIETY.

A MEETING of this society on Jan. 8th, with Dr. H. H. MILLS, the President, in the chair, wa devoted to a discussion on the

Treatment of Carcinoma.

Mr. MALCOLM DONALDSON pleaded for the setting up of diagnostic centres for cancer. It might b suggested that this would increase the number o neurasthenics, but he personally believed that th more malignant disease was talked about the les would people be frightened of it. Centres for diagnosis should be established all over the country, bu the treatment centres, on the other hand, ought to b few and concentrated. If advance was to be made i treatment the cases must be brought to places wher special team-work could be undertaken. After treatment the patients must be seen at least once a mont in the first year, and must report three or four time a year for the rest of their lives. Going on to speak o therapeutic methods, Mr. Donaldson said that th

majority of gynæcologists now—certainly in
r countries, and increasingly in this country—
ved that radiotherapy was preferable to surgery
ie treatment of cancer of the cervix. In cancer of
body of the uterus surgery undoubtedly showed
er results than radiotherapy. though the latter
ht prolong the patient's life in cases unsuitable
operation. Carcinoma of the vagina should be
ted by radium; malignant disease of the ovary
om gave rise to symptoms before it was past all
e of relief by operation.

r. A. Piney thought that the problem of the
tment of cancer was ultimately a problem of
motherapeutics. Work had lately been done on
injection of various colloidal dyestuffs, which
eared to be stored in the tumour cells more than
the normal tissue cells, and attempts had been
le to introduce solutions of heavy metals with the
that the tumour might then be better treated
h X rays. None of these methods as yet had
ved successful, even in experimental animals, but
y pointed the way to ultimate rational treatment
the malignant cell. It appeared to him that at
sent surgery must inevitably be of enormous
ortance, for removal of tumour cells must be
ferable to destruction in situ, in view of the possi-
ty that some of them might receive a stimulating
wth of rays. Tumour cells sometimes grew fast
en their neighbours had been destroyed.

Ir. Duncan Fitzwilliams declared that the
provement of results during the last 40 years was
solely to early diagnosis. and not in the least to
reased range of operation. Nowadays the young
ctitioner who saw a tumour realised that it should
regarded as malignant until it was proved innocent,
d that the onus of proof was on himself. Until this
s recognised no advance would be made. A good
l could be done by educating the lay public not to
ore bodily ailments of which they knew nothing,
d to go to their doctor and get advice. The
nericans, who were untrammelled by the traditions
ich bound us, had instituted "cancer weeks,"
ring which it was a point of honour for every
rson in the town to go to his medical practi-
ner and be examined thoroughly; if he could
t afford a fee, payment was made by the local
ncer committee.

Sir J. Dundas-Grant was convinced that where
malignant disease was removable it ought to be
moved. When he was in general practice the cervix
eri used to be removed, and in many cases the cure
as permanent. He believed in the combination of
rgery and radiotherapy, and that this would be
ore and more developed.

Mr. J. F. McCann said that the lesson of occupa-
onal cancers was being ignored. These could. almost
ithout exception. be prevented by taking the
ecessary precautions. In this matter we suffered a
reat deal from the tyranny of pathology. Most
eople now believed that cancer was in the beginning
local disease—an idea that had been fostered through
boratory experiments. But he held the contrary
pinion. He preferred to make his judgment on the
uman, and had found that in very early cases there
as always a certain departure from health—the
rimary cachexia of former writers. In some cases
t might be slight and escape notice. in other cases it
as extreme. It had to be remembered also that
ancer was primarily a disease of middle or advanced
ge.

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TUBERCULOSIS ASSOCIATION.

AT a meeting of the Tuberculosis Association on Jan. 15th a discussion took place on the

Psychotherapeutic Treatment of Tuberculous Patients.

Dr. S. VERE PEARSON, opening the discussion, said that he, in dealing with smaller numbers of patients than many of the physicians present, probably had the advantage of being able to devote more individual attention to the patients under his care; and hence it was probable that his patients were more frequently able to unburden their troubles and worries than would be possible in larger institutions. This mere unburdening was often of definite therapeutic value, and anything like psycho-analysis was very seldom necessary. All experienced sanatorium physicians knew how important it was to have a constant stream of mental encouragement playing upon the mind of the patient, this, in conjunction with good environment and proper treatment of the physical condition, being usually sufficient to bring about satisfactory improvement. In considering the pathogenesis of tuberculosis he believed that too much emphasis was laid upon infection by the tubercle bacillus and too little upon the psychological influences involved. In order to get a patient well they had to take into account all the ætiological factors concerned. It was necessary to recognise all the conditions which had wrought a "discord of the elements within the body," otherwise harmony and health could not be brought about. A realisation of these factors was equally necessary for diagnosis, prognosis, and treatment. Unless the psychological condition of a patient was taken into account, mistakes in diagnosis were bound to occur. It had been said that "phthisis *always* had an origin in discouragement," and although this might be only partially true they had to remember the possibility of a "psychological flight into illness." It was important for the physician in charge of a case at least to bear in mind the possibility of pulmonary tuberculosis not being the cause of the lapse from health, or of its being only one of the causes and perhaps, even in a case with markedly abnormal physical signs in the chest, one of comparatively minor importance.

The Mind in Tubercle.

Dr. ANDREW MORLAND (Mundesley Sanatorium) followed with a paper on this subject, which is published in full on p. 176 of this issue.

Dr. LEONARD F. BROWNE, dealing with the psychotherapeutic treatment of tuberculous patients, pointed out that tuberculosis being a chronic disease should be viewed from the psychotherapeutic aspect just as in the case of any other chronic toxic disease. While psychotherapy could not supersede physical treatment, it could reinforce it admirably in certain directions. The patient's attitude to life would make an enormous difference to his powers of resistance. Upon admission to the sanatorium some routine psychological examination should be made, so that the physician might get a picture of the type of personality with which he was dealing. Information as to the patient's heredity and family environment should be acquired. Reaction to former illnesses was of importance, and full particulars should be obtained of the patient's sexual history, attention being paid to any indications of arrested or warped development. The question of anxiety should be gone into, and inquiry made as to the patient's ability to adjust difficulties in his envir ment. In the very first interview the doctor wo have the opportunity of establishing that relations with the patient which was so valuable a therape asset. The importance of the personal factor being more and more recognised in industry, in polit and in international relations. It was no important in the sanatorium, and the personality the physician played a large part in the treatm of the disease. In the long treatment wl tuberculosis so often required, the relations betw the doctor and his patient became very intim There was probably no disease which called higher personal qualities in the medical man treated it than tuberculosis. A strong personal wide sympathy and understanding, approachablen infinite tact and discretion, a willingness to dis problems, and a sense of humour were essen qualities in dealing with the varied temperam and mental outlook of patients suffering from disease. The method of suggestion or persua was of value in dealing with the general attit of the patient to his disease and in overcoming cer troublesome symptoms which might arise during course, such as insomnia, cough, or anorexia. In ot cases, however, patients suffering from such co tions as anxiety states or conversion hysteria—wl might in themselves have paved the way for tuberculous infection—would require analytical tr ment, although it would always be a question whe any given case was suitable to undergo the strai analysis, and the advantage of mental improven would have to be weighed against the possibilit physical deterioration. In conclusion the spe emphasised the importance of treating the persona of the patient. His individuality should never lost sight of; his mental attitude should be stu and taken into account in the doctor's dealings him. It would be an immense help for the stai every sanatorium to include a physician with s knowledge of psychotherapy so that special tr ment could be provided when necessary. In any c for any doctor dealing with tuberculous pati a knowledge of the mental mechanisms would en him to deal with the patient's reactions on the s and incidentally would greatly increase the inte of his work.

WEST LONDON MEDICO-CHIRURGIC SOCIETY.

A MEETING of this society on Jan. 8th, Dr. H. H. MILLS, the President, in the chair, devoted to a discussion on the

Treatment of Carcinoma.

Mr. MALCOLM DONALDSON pleaded for the sett up of diagnostic centres for cancer. It might suggested that this would increase the numbe neurasthenics, but he personally believed that more malignant disease was talked about the would people be frightened of it. Centres for d nosis should be established all over the country, the treatment centres, on the other hand, ought t few and concentrated. If advance was to be mad treatment the cases must be brought to places w special team-work could be undertaken. After tr ment the patients must be seen at least once a mo in the first year, and must report three or four ti a year for the rest of their lives. Going on to spea therapeutic methods, Mr. Donaldson said that st majority of gynæcologists now—certainly in er countries, and increasingly in this country—ieved that radiotherapy was preferable to surgery the treatment of cancer of the cervix. In cancer of body of the uterus surgery undoubtedly showed tter results than radiotherapy, though the latter ght prolong the patient's life in cases unsuitable operation. Carcinoma of the vagina should be ated by radium; malignant disease of the ovary dom gave rise to symptoms before it was past all pe of relief by operation.

Dr. A. Piney thought that the problem of the atment of cancer was ultimately a problem of emotherapeutics. Work had lately been done on e injection of various colloidal dyestuffs, which peared to be stored in the tumour cells more than the normal tissue cells, and attempts had been ade to introduce solutions of heavy metals with the ea that the tumour might then be better treated ith X rays. None of these methods as yet had oved successful, even in experimental animals, but ey pointed the way to ultimate rational treatment the malignant cell. It appeared to him that at esent surgery must inevitably be of enormous portance, for removal of tumour cells must be eferable to destruction in situ, in view of the possi-lity that some of them might receive a stimulating owth of rays. Tumour cells sometimes grew fast hen their neighbours had been destroyed.

Mr. Duncan Fitzwilliams declared that the nprovement of results during the last 40 years was ue solely to early diagnosis, and not in the least to icreased range of operation. Nowadays the young ractitioner who saw a tumour realised that it should e regarded as malignant until it was proved innocent, nd that the onus of proof was on himself. Until this as recognised no advance would be made. A good eal could be done by educating the lay public not to nore bodily ailments of which they knew nothing, nd to go to their doctor and get advice. The mericans, who were untrammelled by the traditions hich bound us, had instituted "cancer weeks," uring which it was a point of honour for every erson in the town to go to his medical practi-ioner and be examined thoroughly; if he could ot afford a fee, payment was made by the local ancer committee.

Sir J. Dundas-Grant was convinced that where malignant disease was removable it ought to be emoved. When he was in general practice the cervix teri used to be removed, and in many cases the cure was permanent. He believed in the combination of urgery and radiotherapy, and that this would be more and more developed.

Mr. J. F. McCann said that the lesson of occupational cancers was being ignored. These could, almost without exception, be prevented by taking the necessary precautions. In this matter we suffered a great deal from the tyranny of pathology. Most people now believed that cancer was in the beginning a local disease—an idea that had been fostered through laboratory experiments. But he held the contrary opinion. He preferred to make his judgment on the human, and had found that in very early cases there was always a certain departure from health—the primary cachexia of former writers. In some cases it might be slight and escape notice, in other cases it was extreme. It had to be remembered also that cancer was primarily a disease of middle or advanced age.

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REVIEWS AND NOTICES OF BOOKS

Intracranial Pyogenic Diseases.

By A. LOGAN TURNER, M.D., F.R.C.S. Edin., and F. ESMOND REYNOLDS, M.D., M.R.C.P. Edin. London: Oliver and Boyd. 1931. Pp. 271. 12*s*. 6*d*.

SOME nine years ago Mr. Logan Turner and Dr. Esmond Reynolds began to investigate the pathways by which infection spreads from the face, nasal, and paranasal air cavities into the intracranial chamber. and this monograph gives a full account of their work. They have carefully studied 55 cases, mostly fatal, of intracranial infection following such conditions as ethmoidal and sphenoidal suppuration, and in a considerable number of these they have conducted exhaustive morbid anatomical investigations along special lines. Their method has been to remove at necropsy a large part of the floor of the anterior and middle cranial fossæ and then to examine in serial sections the upper part of the nose, the air sinuses, orbits, base of the skull, cavernous sinuses, and overlying membranes. In spite of the frequency of fatal intracranial infections from these sources the authors have only been able to find in the literature eight cases in which adequate investigations of this nature have hitherto been made.

As a result of their work Mr. Logan Turner and Dr. Reynolds conclude that in their 55 cases infection spread to the intracranial cavity by the venous blood stream in 19 cases, by direct extension through bone and dura in 20 cases, by a combination of these two routes in eight cases, and along the perineural sheaths of the olfactory nerves in four cases. In four cases the pathway of infection could not be determined. Selected cases are described in full to illustrate the various paths of infection, and there is an excellent account of the venous and other connexions between the face, nose, and paranasal air cavities, and the intracranial chamber. The authors show effectually that there is no lymphatic pathway from the nose to the cranium.

Septic thrombosis of the cavernous sinuses occurred in 22 cases, especially after infection of the sphenoidal air cavity. The authors describe fully the symptoms of this condition, and as far as possible correlate the symptoms with the pathological changes that their studies revealed. Their researches show that it is not possible to interpret all the symptoms conclusively, because most fatal cases show infection of more than one intracranial structure; for example, there are intimate venous connexions between the cavernous sinus and the meninges, and suppuration in the cavernous sinus is likely soon to be followed by purulent pachy- and leptomeningitis. Brain abscess is relatively uncommon in their series. In describing leakage of brain abscess no reference is made to leakage into the lateral ventricles, probably the most common method of spread of abscess of the cerebral hemisphere.

The book contains important observations about intracranial infection following operation on the paranasal air cavities, a subject on which there has hitherto been very little accurate information. In 45 cases in which the primary focus of infection was in the paranasal air cavities, intracranial infection occurred spontaneously in 25, while in 20 it developed shortly after operation on one or more of the diseased air cavities. Operation on the ethmoidal cells of the type introduced by Sluder appears to be particularly dangerous in this respect, and may result in spread of infection either by producing fracture of the floor of the anterior fossa, laceration of the olfactory perineural sheaths, or in some instances by setting up acute osteomyelitis of the cranial and facial bones. Alarming as they are, complications of this sort occurred in only about 1 per cent. of a large series of operations on the paranasal air cavities at the Royal Infirmary of Edinburgh, and most often in those cases in which more than one paranasal air cavity contained pus and only one was drained by operation. It is possible that the liability to intracranial infection after paranasal operations may be considerably diminished by more free exposure of the infected areas.

This beautifully produced monograph follows the best traditions of Scottish medicine and is fit to b placed alongside the classic work of Macewen o intracranial infections. There is only one criticism of importance: that the authors have been unduly cautious in drawing the conclusions of a clinica nature that their work entitles them to make, especiall conclusions as to treatment. The reader is lef wondering what their views about surgical intervention in chronic paranasal infections really are; an whether this work has promoted the clinical recognitio of those cases that are likely to be followed by fat intracranial infection if operation is undertake There is no one more entitled to propound such vie than Mr. Logan Turner, and no one from whom t general medical reader would more welcome them.

The Pathology of Diabetes Mellitus.

By SHIELDS WARREN, M.D., Pathologist to the N England Deaconess Hospital, and the Huntingd Memorial Hospital, Boston; Instructor in Path logy in the Harvard Medical School, Bost Massachusetts. London: Baillière, Tindall a Cox. Pp. 212. 21*s*.

THIS monograph is important inasmuch as contains a full and exhaustive account of the pat logical lesions found in all the organs of the body patients who had diabetes mellitus during life. Rat more than one third of the monograph is devoted t description of the islands of Langerhans, together w the proof that the β cells supply insulin to the bo The evidence for the pathological changes is set fully, and Dr. Warren points out that, although β cells undoubtedly secrete the insulin, the chan which occur in the islands in patients dying of diab mellitus by no means afford conclusive proof of t The most typical change is hyalinisation, wh destroys or separates the epithelial cells from blood-supply. The diabetes which is associated w hyalinisation of the islands is apt to be mild, a even in patients over 40 years of age, a fair numbe cases are described in which hyalinisation exis without the occurrence of diabetes.

In the older patients fibrosis tends to occur as as hyalinisation. Lymphocytic infiltration in about the islands has been observed, especially severe cases of short duration. Much importanc attached by Allen to hydropic degeneration, a result of his observations on partially depancreati animals. This change appears to be due not to result of injury but to excessive functional strain, its appearance is thus a sign that an increased str is being put on the β cells. Hydropic degeneratio always present in patients dying from diabetes, , moreover, post-mortem changes may cause very ilar appearances. One of the difficulties of ssing the importance of these changes lies in the that in 69 out of 259 cases the pancreas showed nds which appeared quite normal.

he distribution of glycogen in the body of normal ients, and in diabetics who have been treated with without insulin. is of great interest. An increase lycogen in the epithelium of Henle's loops is the t definite anatomical finding in active diabetes litus, but the heart muscle also contains more ogen, and the liver cells have vacuoles which are d with it. The skin of the diabetic, on the other d, contains very little glycogen. Dr. Warren deals y with arterio-sclerosis and gangrene in diabetics. tistical evidence that a premature development of rio-sclerosis occurs among the diabetic patients is clusive. Although this condition is especially mon among the elderly patients, it occurs also ong the young. Seven out of 23 patients under years in the series showed definite changes in arteries when X rayed. Arterio-sclerosis was the ual cause of death in 72 out of 300 cases. In 31 these a coronary thrombosis was present, and in gangrene of an extremity. The factor or factors ich may be responsible for the premature development of the arterio-sclerosis in diabetics are discussed. e view is put forward tentatively that it is in some y due to the initial period of hyperglycæmia which ises the damage, and is followed up by the hyper- lesterinæmia arising as the result of a diet con- ning too much fat and too little carbohydrate. The pendix contains an analysis of the cause of death 1294 diabetics.

The book is well indexed and provides information high value to all interested in the subject.

e Cardiac Cycle.

By HARRINGTON SAINSBURY, O.B.E., M.D., F.R.C.P., Consulting Physician to Royal Free Hospital, Victoria Park Hospital for Diseases of the Chest, and Royal National Hospital, Ventnor. Bristol: John Wright and Sons, Ltd.; London: Simpkin Marshall, Ltd. 1931. Pp. 79. 5s.

IN his small monograph on the cardiac cycle r. Harrington Sainsbury advances the hypothesis at the pulse wave is produced not by the ejection of ood from the left ventricle into the aorta, but by the ipact of the ventricular contents against the closed milunar valve during the isometric phase of ven- icular systole. This hypothesis is so entirely compatible with the known experimental facts, iat one cannot help wondering whether his meaning ay not have been misunderstood. His argument ppears to be that the force exerted during systole gainst the ventricular surface of the closed aortic alve must produce an equivalent pressure change in ie aorta which will be transmitted along the arteries the periphery, and that this pressure change onstitutes the pulse. That there is a slight rise of ressure in the aorta corresponding in time to the rise f pressure in the ventricle prior to the opening of the ortic valve is well known; but this rise is insigni- icant as compared with the rise of pressure which ccompanies ventricular ejection. In order to upset he current teaching that the percussion wave of the ulse is initiated by ventricular ejection, it would be ecessary to bring forward experimental evidence to rove that the time relations of the pressure changes in the heart and aorta observed by previous workers are incorrect. Dr. Sainsbury does not suggest that this is so, nor does he bring forward any new experimental evidence in support of his views. His argument is purely philosophical, and if we have understood it correctly, it is unsound.

The Lungs and Early Stages of Tuberculosis.

By LAWRASON BROWN, M.D., Consultant, Foudeau Sanatorium; and FRED H. HEISE, M.D., Medical Director of the Sanatorium. London: D. Appleton and Co. 1931. Pp. 151. 5s.

THE object of this book was to present the subject of tuberculosis "from a standpoint that can be readily understood by the layman," and it has been achieved. Members of public health committees, health visitors, nurses and, indeed, all who are interested in preventing disease and in safeguarding the health of the young, will find in this book all they require for an understanding of the problem of tuberculosis, whether regarded as a disease of the individual or as a menace to the community. The chapters on the early symptoms of tuberculosis and the means which should be adopted for its detection might be read with advantage by all medical students. And medical practitioners might profit from the reminder that in a doubtful case no examination of the chest is complete which does not include a radiogram of the best obtainable quality, interpreted by someone who has had special experience in chest radiography.

Fractures.

By MEURICE SINCLAIR, C.M.G., M.B., B.Ch. Edin., Major, R.A.M.C. Ret., Specialist in Fractures and Orthopædic Surgery to St. James' and Paddington Hospitals, London. With an introduction by Sir ROBERT JONES, Bt., K.B.E., C.B., F.R.C.S. London: Constable and Co., Ltd. 1931. Pp. 550. 24s.

THOSE who were familiar with Major Sinclair's work during the war at No. 8 Stationary Hospital know him as a master of technique and painstaking care, whose results in the treatment of war fractures were an inspiration to all who came in contact with them. We welcome an account in book form of his principles and methods of treatment. The first part of the monograph is devoted to a consideration of principle and the second to detailed methods of treatment of individual fractures, and both are clear, well written, and full of interest from beginning to end. There is a certain air of dogmatism which might be irritating to those who do not discern in it the mark of the enthusiast; the insistence on attaching the author's name to splints and apparatus might equally seem exaggerated to a generation which does not remember the difficulties which any original work had to overcome during the war before gaining recognition. No one should allow any such minor points to lead them to neglect this work. It should be studied by every one who is concerned with fracture cases, and should do a good deal to remove the reproach that the lessons so slow and painfully learnt during the war are being forgotten with indecent haste. Sir Robert Jones says in his introduction that the author's services at the front were memorable and never received the recognition they deserved. This book should do much to secure for him appreciation of his mastery of the technique of the treatment of fractures.

Radiology in Relation to Medical Jurisprudence.

By S. Gilbert Scott, M.R.C.S., L.R.C.P., D.M.R.E. Camb., Consulting Radiologist to the London Hospital and to Queen Alexandra Military Hospital, Millbank. London : Cassell and Co., Ltd. 1931. Pp. 65. 7*s.* 6*d.*

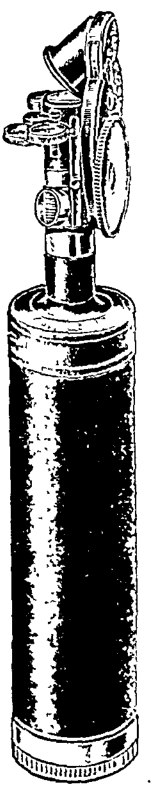
This small volume aims at assisting radiologists in medico-legal cases. It is based on the wealth of material that has passed through the author's hands in the course of 22 years, during which time he has been in charge of the radiological department of the London Hospital. With such a vast experience behind him Dr. Gilbert Scott might well have written a rather more ambitious work. It only contains 65 pages, and a quarter of these are devoted to an extremely elementary statement of the fundamentals of radiology, written for the benefit of the legal profession.

The author confines himself to the osseous system, and says that he has made no attempt to describe all the variations from the normal nor every one of the fallacies and pitfalls which beset radiologists in general medicine. Hence the work is somewhat incomplete even in the limited sphere that the author has chosen. One omission should be rectified in a future edition. Dr. Gilbert Scott, while describing the usual spinal conditions, fails to emphasise the fact that the absence of radiographically demonstrable bony injury does not necessarily mean that the patient has not received an injury and that this injury is real. In the courts stress is laid on the positive evidence of an injury as shown by the radiographs, and compensation results as a matter of course, even though actual disability may be slight. The absence of radiographic evidence of injury prejudices a man's claim for compensation and many cases of miscarriage of justice result. It is the radiologist's duty in such cases to emphasise the limitations of his technique and to stress the fact that the decision in such a case must not be influenced by the absence of changes that can be detected radiographically. This is an important point, especially in spinal cases. The 25 radiographic illustrations are well chosen and excellently reproduced.

NEW INVENTIONS

AN ELECTRIC OPHTHALMOSCOPE.

The optical part of this ophthalmoscope was shown to the Ophthalmological Society of Great Britain and Ireland in 1904, and a description of the mechanism was given in The Lancet (1905, ii., 28). Recently, Messrs. Rayner, of Bond-street, London, who had acquired the original patterns, asked me if I would supervise the adaptation of the original reflecting ophthalmoscope to a self-contained electric fitting.



The new model has certain advantages. The attachment of a battery handle to a magazine ophthalmoscope, such as Couper's or Morton's adaptation thereof, produces an inconveniently long instrument. This new ophthalmoscope, although it has a range of 70 dioptres, from +30 to −39 in steps of 1 dioptre, is no longer than a May's ophthalmoscope with its small range of lenses.

The range of 70 dioptres is produced by 15 actual lenses. The mechanism which I adapted to this ophthalmoscope was invented by Harding, an engineer of Leeds, about 1870, and is thoroughly reliable. It has been extensively used in speed indicators, meters, and stop-watches. The first of these ophthalmoscopes, made in 1903, I have used regularly since then; it has never got out of order.

There are two lens discs. These overlap at the sight hole. The larger, or "units" disc has ten holes, one blank and nine glazed from −1 to −9 dioptres. At one point on the rim of this disc there is a finger-like projection. The smaller, or "tens" disc has seven holes, one blank the others glazed +10, +20, +30, −30, −20, −10 dioptres. On one face of this "tens" disc is a spur wheel of seven teeth. As the driving wheel is turned past 9 dioptres, the "finger" of the "units" disc automatically engages with the spur wheel and moves the "tens" disc one place either way, according to the movement of the driving wheel. The edge of the "tens" disc is milled, and one part is exposed through the edge of the body of the instrument, so that it can be turned directly to bring a strong convex lens to the sight *hole.*

In providing an electrical attachment, the aim has been to secure the widest, most variable, and most stable range of illumination. The battery supplying the lamp is a standard "Ever Ready" pattern No. 1829. It will keep the lamp burning continuously for over 13 hours, stil giving sufficient illumination for examination of the fundus continuous discharge is a severe test. The lamp is gas filled, and has a small coil filament.

A focusing lens controlled by an external collar regulat the beam from the instrument. When the collar is at th bottom position, a slightly diverging beam giving th effect of a plano mirror retinoscope is produced. As th collar is moved upwards the beam becomes convergin until a very short focus is reached, after which the bea becomes increasingly divergent. At a distant of one inc the illumination varies from considerably over 100 fo candles with the filament almost focused, to about 30 wi the most widely divergent beam. By using the resistan in the circuit the divergent beam can be reduced to 2 fo candles. Great care has been taken to ensure a fine contr of the focusing movement.

Four cells are hinged to the lamp tube and can be int posed between the light and the mirror. They conta filters, red, green, and "daylight," and a diaphragm wit small central hole. These screens can be readily broug into use and are very serviceable.

The instrument is excellent for retinoscopy at t distance of one metre, either with the white or r light. It has proved itself to be a first-rate emergen operation lamp, since it will throw a beam of paral rays of about 20 foot candles from a distance 6 inches which will illuminate the eye and lids; a as the ophthalmoscope is held horizontally above t eye it is easy to keep it in position and out of t operator's way.

Finally, mention may be made of the covering the handle which contains the battery. *This* coated with an even layer of fine sand which gives perfectly easy grip. The instrument can therefo be held easily with the fingers with *no* sense of ri of slipping and without the damp chilly feeli which comes to leather covered handles after mu usage.

The instrument is packed in a case with an arrang ment which allows of its immediate extraction wh it is required.

N. Bishop Harman, F.R.C.S. Eng.

de KUYPER'S

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Distilled from genuine malt liquor with the Juniper berry added. The advantage gained by distilling the berry with the spirit is the production of a preparation of Oleum Juniperi, mellow and free from irritating properties.

Oleum Juniperi is official in the British Pharmacopœia, and is described as carminative, anti-spasmodic, and a stimulating diuretic.

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esting milk or purity

urity has become an exact cience at Bournville. Cadburys' nalytical chemists are for ever naking searching tests of ingredients that have in the first place been selected for their purity and goodness. Throughout that vast "factory in a garden" the most scrupulous cleanliness is observed. "Absolutely Pure" is Bournville's motto.

3

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THE LANCET.

NDON: *SATURDAY, JANUARY 23, 1932.*

THE CERTIFICATION OF BLINDNESS.[1]

COMMITTEE was appointed in November, 1930, the Union of Counties Associations for the nd to report on the problems of the prevention blindness. The committee, which was given wer to coöpt persons to its body, availed themves freely of the permission, and the result is a animous report of extensive utility. For the nomic importance of blindness from the national int of view has been pressing since 1919, when ants in aid of the welfare of the blind were first ide by the Ministry of Health. Pensions were en granted to all persons over 50 years of age o were "so blind as to be unable to perform y work for which eyesight is essential," while 1920 the Blind Persons Act was passed which t these grants and pensions on a permanent sis. Grants through local authorities are now ade at rates varying from 15*s.* to 27*s.* 6*d.* a week, d pensions to the blind who are over 50 years of ge are provided by the State at the rate of 10*s.* week. But unfortunately, even now, no uniform ystem of registration and certification of the lind is in force in England. The Ministry of Health ave been endeavouring for a long period to ersuade the local authorities to adopt a registraion clause providing for the certification of the lind by a medical practitioner with special xperience in ophthalmology, but in the summer f 1931 only 52 per cent. of the counties and ounty boroughs of this country had either ormally or informally adopted this proposal. Further, many of these local authorities only fell n with the process of registration in respect of ases which were considered doubtful, and that is a matter where, except in cases where both eyes have been excised, it is unwise to leave decisions to the judgment of any but a skilled ophthalmologist. The committee's first recommendation, therefore, is that the employment of an ophthalmic surgeon should be made compulsory in every case before a blind person is put on the register as such. With regard to the grant of Old Age Pensions the rocedure is somewhat different, but even here here exists no guarantee that the local pension officer may not decide the claim of an applicant without ever having had the opinion of a skilled ophthalmologist.

At present it is possible for a person to be put on the blind register by the local authority and to be refused a pension by the pension authority when he attains the age of 50, and vice versa. The second recommendation of the committee is, therefore, that the procedure for certifying blindness, both for the purpose of entry in the blind register and for the granting of blind Old Age Pensions, should be unified. It must be emphasised that the actual certification of blindness may be a matter of considerable difficulty, and up till now there has certainly been a lack of uniformity in the standard required by various authorities in interpreting the phrase "so blind as to be unable to perform work for which eyesight is essential." A circular issued by the Ministry of Health, not as a rigid instruction, but as a guide to the certifying surgeon, puts a visual acuity of 3/60 as a limit under which a person may *usually* be considered blind, while those with vision 6/60 or better cannot be considered blind unless there are other visual disabilities, and more especially a greatly contracted field of vision. Concerning those with vision between 3/60 and 6/60 the circular is indefinite, and it is evidently intended that in deciding on these difficult borderland cases a good deal should be left to the discretion of the certifying surgeon. In making their recommendations as to future procedure the committee have taken as a model the system recently introduced into Scotland, after having been for a few years in actual work in Glasgow. This system provides for the examination of every case by *two* experts, so that personal idiosyncrasy may be checked. For this purpose a limited number of clinics have been organised in the chief centres, while for outlying districts special arrangements have to be made. The clinic system is being used in Scotland to secure, in addition to the certificate, a statement of the cause of blindness, and with this purpose in view a form has been drawn up on which the results of the examination have to be stated in considerable detail. The committee recommend that this system should be adopted. Stress is laid upon the necessity of stating not only the condition of the eyes which involves blindness, but also its cause. Certain detailed recommendations are made with regard to the definition of blindness, with special reference to the borderland cases in which the visual acuity lies between 3/60 and 6/60; guidance as to what degree of defect of the field should be considered as a factor is given, while the age of the patient at the time, and not when the onset of "blindness" occurs must also be taken into account. Such directions should give much needed help in his difficult task to the certifying surgeon, while leaving him with a good deal of personal responsibility. The Scottish plan of requiring every certificate to be signed by two ophthalmic surgeons when possible is therefore specially to be commended.

Besides the form of certificate of blindness applicable to adults, suggested in the report, forms are framed of two certificates for children under 16. Here, for purposes of the Education Act, the definition of blindness now in use is "too blind to be able to read the ordinary school-books used by children," and these forms of certificate are framed for two purposes. First, their employment would enable the education authorities to discriminate between children so blind that they can only be appropriately taught in a special school or class for *totally* blind children, from those who can appropriately be taught in a school or class for the *partially* blind. Secondly, these certificates would distinguish between those children who, when they attain the age of 16, are likely to be so blind as to come within the provisions of the Blind Persons Act, and those of whom this cannot be said. There is also a form of certificate meant to apply to those cases of partial blindness of a progressive character not yet blind enough to fall within the provisions of the Act but likely to become so at a later period. It is obvious that the information which these examinations and certificates are meant to elicit would be of value also in determining whether children with defective sight are more suitably educated in an ordinary school, a blind school, or a special school or class for the partially blind. It is also obvious that to obtain reliable information on all these points cases must be examined with care, knowledge, and skill. We therefore heartily commend this important report to the consideration of the authorities concerned.

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[1] Report on the Certification of Blindness and the Ascertainment of the Causes of Blindness. Copies from the Secretary, Prevention of Blindness Committee, 68, Victoria-street, S.W. Price 1s.

MODERN HOSPITAL CONSTRUCTION.

THIS is not a time to contemplate with equanimity the demands of a community for a new hospital. In this country hospital beds are admittedly wanted, and badly wanted in many places, but, as far as possible, we must mostly rely upon modifications, annexes, and partial rebuildings and adaptations, even though the policy of providing a whole new hospital would be the best course. Indeed, it might be in the long run the more economical direction of effort, but the general financial position does not allow of the expenditure of large sums to-day in order that still larger sums may be saved later. To many, therefore, it may seem inopportune just now to call attention to the modern principles of hospital construction, but there are reasons for the other view. First, we can contemplate the ideal and learn lessons for the future without the temptation to spend; and, secondly, we can from scrutiny of the latest manners in hospital construction derive valuable lessons for procedures of renovation.

The last issue of *Nosokomeion*, published in October, 1931, contained a series of articles on modern hospital construction by leading specialists in England, America, France, Germany, and Italy. These show in a most suggestive fashion that fundamental changes in hospital planning have been taking place recently upon American models. And though the details of structure vary with the architectural tendencies of each country certain common principles have been evolving. The pavilion system which long remained the standard type is no longer followed in an invariable way. The ward units are more often placed vertically one above the other, rather than side by side as formerly. The sanitary tower is also disappearing though it had many architectural advantages. Taller buildings, smaller wards, larger windo space, and a more ample provision of balconi are among the more obvious changes noticeable i modern hospitals. They have been brought about by a desire for efficiency and economy expressed by a more compact plan and a more concentrated arrangement of the engineering services, and they take note, inter alia, of such different things as modern views on cross-infection the desire for greater privacy and comfort for the patients, and safety as evidenced in new methods of fireproof construction. In all these things no doubt the influence of American hospital planning has been a powerful factor in bringing about changes in European countries. For example, the Columbia-Presbyterian Medical Centre in New York City, an illustrated account of which was published in a special supplement to THE LANCET,[1] is echoed in France by the designs for the Hospital at *Clichy*. But in this building the balcony projection on the cantilever principles has been made a strong feature of the design, particularly on the tenth and eleventh storeys where it is continuous. These two top storeys not only form an effective horizontal line to the top of the building but provide open-air lying-space for tuberculous patients. The balcony principle has been carried a step further in another French example, the hospital at Colmar, where the terrace type of balcony has been employed in an ingenious way. The storeys are set back one behind the othe on the south side to provide balconies for th patients, but the building has only six storey making no attempt to "sky-scrape"; to emplo usefully the width of the lower floors, a series o overhangs have been built. This was mad possible by using reinforced concrete and show that in times to come the architects of hospita must take this form of building into consideratio Many of the points mentioned appear in graph illustrations and ground plans which are reproduce in this journal, but the chapter in *Nosokomei* on German hospitals is not illustrated. Th is unlucky for some of the most interesting modern hospitals have been erected in that countr But as Herr v. A. LOMMEL, the writer of the chapt points out, the present economic crisis may res in a central corridor type of plan. But it is to hoped that the small ward, facing south and openi off a north corridor, will continue in favour. Ma of the changes in hospital construction to whi attention has been drawn are well illustrated in t designs for the new Freemasons' Hospital, Ravenscourt Park, of which an excellent sket plan appeared in the *Times* on Wednesday last.

In England among the most interesting develo ments noted in the hospitals selected for not is the increased use of the type of ward in whi the beds are placed parallel with the walls, wi glazed metal screens separating the heads of t patients. Mr. C. E. ELCOCK, who is responsi for the chapter on the present position of hospi construction in this country, describes and illu trates the variation of this type which he names t verandah" ward (because no verandah is quired). with large horizontal window spaces. ie right proportion of window space to wall ace is largely a matter of opinion. but we should rselves consider it important to avoid very large ndows except towards the south. The lively erest taken in hospital planning in Europe and nerica and the evident desire for new ideas in hitecture to keep pace with progress in medical ence must be welcomed as signs of healthy tivity. But modern hospital planning has anges, almost revoluntionary in character, to be epared for. The increase in special classes of tients and the probability that sooner or later h and poor will, to an increasing extent, be ated under one roof, on some graded principles fee, demand variety and flexibility of planning. e treatment of out-patients in special departments ll affect the hospital planning of the future dically. and the need for expansion in these rections must necessitate ample open space und any new hospital buildings. With regard this point past history and present circumstances ow only too clearly the folly of producing a st-iron plan with all spaces allocated. There much to think about, and it is to be hoped that ought will be taken during the breathing space nforced upon us by poverty. The time will come ; t us be ready.

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[1] THE LANCET, Jan. 5th, 1929.

COMPLICATIONS OF TONSILLECTOMY IN CHILDHOOD.

The convalescence of children after the removal tonsils and adenoids is usually uneventful, but e complications of an operation so frequently erformed must necessarily reach a considerable tal Of these, hæmorrhage, reactionary and condary. is the most common, but others also re important, as Mr. J. A. Keen [1] shows from his sperience of 9344 such operations performed by im at the Leicester school clinic during a period f ten years. In the first place, as he points out, he various sequelæ cannot, of course. always be onnected directly with the operation. Tonsillecomy is performed throughout the year, irrespective f season or weather ; many of the children come rom, and quickly return to, overcrowded homes, nd have attended school on the day before peration, where they are subject to infection with olds and with the infectious fevers. On the whole, herefore, it is surprising that more children do ot have some disturbance of convalescence, and perations must occasionally be performed on those who are sickening for some infectious illness. This point is well brought out by Mr. Keen's figures of the incidence of the acute specific fevers after the tonsil and adenoid operation which are as follows : diphtheria 3, measles 4, mumps 2, whooping-cough 1, and chicken-pox 7, with 5 doubtful cases of scarlet fever, and 18 cases of scarlatiniform rash. All three cases of diphtheria were of a severe laryngeal form, and two of the patients died. In these, as in other types of infectious fever, there is probably no direct relationship between the disease and the operation, but scarlet fever stands in a different category. A difficulty here is that we may have to deal with the so-called "surgical scarlet fever," which is perhaps not true scarlet fever at all. In Mr. Keen's series 18 patients developed a fleeting scarlatiniform rash, usually with a slight rise of temperature. on the second or third day. and he believes that such rashes are not very uncommon after this operation, for they are easily overlooked in the absence of a routine follow-up of cases In addition, five of his patients were sent to the isolation hospital by their own doctors with the diagnosis of scarlet fever : he analyses these cases and comes to the conclusion that they were not true scarlatina but surgical scarlet fever, appearing on the second or third day after operation, of a mild type, and not infectious to others. He believes that this condition is due to infection by some other strain of the streptococcus group but not by that of true scarlet fever. It is noteworthy that the healing of the wounds in the throat is not delayed.

It is otherwise with post-operative septic complications, which in a mild form are not uncommon : here the inflammation does not remain superficial and strictly localised, but spreads to the soft palate or pharynx with delayed healing and more or less severe toxæmia, and later with excessive formation of scar tissue. Mr. Keen estimates that at least one child in every 20 or 30 has some delay of convalescence of this nature. Generalised sepsis, or septicæmia, is fortunately rare, but he encountered five cases in this series with one death ; inflammation of the ears or lungs may occur as complications, but the main disease is a generalised infection. Cervical adenitis is not very unusual ; when glands were enlarged before. they often become larger after operation. though this is quite temporary ; but acute swelling of glands not previously enlarged may also occur, accompanied by a sharp rise of temperature. There were five cases of this kind in the series, and all subsided without suppuration. Of pulmonary complications, all, amounting to 23, were instances of lobar pneumonia, bronchopneumonia, and acute bronchitis. The throats showed no exceptional sepsis and healed in a normal way. A fact of interest is that the seasonal incidence was the same for the summer as for the winter months, but the children are kept in the clinic for 24 hours after operation. Mr. Keen thinks that the development of these acute pulmonary infections may be explained by the possibility that the operation is performed during the prodromal stage of an infection. He rules out irritation of the bronchial mucous membrane by the anæsthetic on the ground of the short administration, which averaged under four minutes, and he considers that this complication cannot be caused by inhalation of blood or septic material, because the operation is a very quick one with the guillotine, the head is kept in the extended position during the manipulations, and the child is turned on to the side immediately afterwards. It will probably not be universally agreed that even these factors are sufficient to prevent altogether the aspiration of material from the throat during operation; the experiments of MAY, THOBURN, and ROSENBERGER,[2] by radiography after the instillation of iodised oil, seem to show that some degree of aspiration is the rule, but that elimination is very rapid. Aspiration is a probable cause of pulmonary abscess, but of this there was no case in the series, and Mr. KEEN's suggestion is a likely one that an infection, already present, was aggravated by the trauma of operation.

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[1] Jour Laryng and Otol , January, 1932, p 1.

Acute suppurative otitis is an important complication, of which there were 60 cases in this series of 9344 operations, besides seven cases of recurrence of a previous otorrhœa. Among these 60 patients were six extremely serious cases of mastoid and intracranial complications with three deaths. These figures are in accordance with the general opinion that acute suppurative otitis is exceptionally virulent when it occurs as a complication of the tonsil and adenoid operation. As referred pain in the ear is frequent, and must be distinguished from true otitis, Mr. KEEN wisely writes of the advisability of removing cerumen before the operation, and he also mentions the harmful effect of letting cold water get into the ear while sponging the face after operation. In his series the infection occurred in the right ear in 37 cases, and in the left in 15, and he found that nearly twice as many children lay on their right side than on their left, thus facilitating the infection of the right Eustachian tube. Incidentally this finding points against damage by cold water, for patients are usually turned on to the right side after the operation. Mr. KEEN also encountered five cases of glottic spasm, three on the operating table and two in bed but before coming round from the anæsthetic; they appear to have been severe, for laryngotomy was performed in one, and on two of the others an incision was begun before the glottis relaxed. This does not agree with the contention that no blood can be aspirated during the operation, for the spasm is almost certainly cause by its entry into the larynx. There was also very unusual case of subcutaneous emphysema apparently caused by glottic spasm and alveola rupture, on the day following operation.

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[2] Jour. Amer. Med. Assoc., 1929, xciii., 589; see THE LANCET, 1929, ii., 784.

ANNOTATIONS

THE COST OF ENGLISH MORALS.

To the lay observer the outlook of the medical profession sometimes exhibits a puzzling mixture of realism and conventionalism, of originality and orthodoxy, of courage and of timidity. This mystifying compound is noticeable in some specialities more than in others. In the specialty of venereology, the outlook is predominantly realistic; here the principles of treatment are adjusted to situations which exist rather than to those which ought to exist. With regard to the principles of prophylaxis, however, medical opinion is—or at any rate was only a short time ago—less unanimous, and was undoubtedly influenced by the different expressions of lay morality. In psychiatry, there prevails a distinctive outlook in such matters as criminal responsibility and the sexual perversions. In relation to certain topics of obvious medical significance, the main body of medical thought is held by some to follow timidly behind an advance guard of lay opinion. There has probably never been an age in which current ideas on sexual questions have been more heterogeneous, fluctuating, and uncertain than the present. The problems of divorce, of regulation of parenthood, of sex education, of preparation for marriage, all of which, in the wider sense, have medical significance, are freely discussed in the press and in popular lectures. Yet medical opinion upon them remains uncrystallised if not actually chaotic. "In regard to these things," writes Sir Thomas Horder in a cautious yet appreciative introduction to a book dealing with these subjects, "there is in England a tremendous and not uncharacteristic inertia." The book, entitled "The Cost of British Morals,"[1] is a forcible and eloquent expression of "advanced" lay opinion. Mrs. Chance's central theme is that the veil of silence which, during the last century, enshrouded all that pertained to human reproduction—a silence which the scientific spirit is now only beginning to penetrate—has cost us much avoidable suffering. In successive chapters she gives illustrations of the
timidity both of the medical and lay approach to t
problems of sexual physiology, sexual educatio
birth control and abortion, and she points to t
sacrifice of happiness which this attitude carries
its train. The book is an energetic and convinci
plea for enlightened investigation, which should p
voke discussion and will be read with profit by man

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[1] London: Noel Douglas. 1931. Pp. 127. 5s.

PERIPHERAL VASCULAR DISEASE.

Now that many peripheral lesions, the result
vascular occlusion, may be relieved by surgery
the sympathetic nervous system, it is becomi
increasingly important that those lesions due
vasomotor spasm should be easily and clea
differentiated from those in which the underlyi
pathological condition is an obliterative disease of
artery and it is useless to hope for improveme
from operation. W. J. M. Scott and J. J. Morto
find that it is possible to gauge the part played
sympathetic vaso-constriction, and thus foretell
probable results of sympathectomy, by means
anæsthesia. They show that under deep gene
anæsthesia or under spinal anæsthesia the sympathe
fibres are paralysed and a uniform degree of va
dilatation is produced all over the area anæsthetis
—that is, of course, assuming that the vascu
supply of the area is intact. As a result of this va
dilatation the skin temperature rises in nor
subjects, at room temperature of 20° C., to at le
31·5° C. (88·7° F.). If the vessel supplying the par
occluded by a structural defect there is vaso-dilatat
and no rise in skin temperature, while if the obstruct
is partly spastic and partly organic the temperat
rises but does not reach the normal level. Clos
similar results are obtained by using a local an
thetic to block the peripheral nerves supplying
part, but the rise in temperature is about 1° C. bel
that reached with spinal or general anæsthesia, si
those sympathetic fibres reaching the vessel hig

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[1] Arch. Int. Med., December, 1931, p. 1065.

) the limb are left unanæsthetised. By this method ott and Morton find it easy to assess the degree to hich the vascular obstruction will be relieved by mpathectomy and thus to choose their cases r operation with more success. P. G. Flothow[2] is obtained similar results, but he prefers to inject e sympathetic ganglia supplying the affected part ith a local anæsthetic. By this method he claims at not only are all the sympathetic fibres eliminated it that also the degree to which pain will be relieved r operation may be prejudged. It is stated that e technique of these injections is simple and that ey cause little discomfort.

REGENERATION OF THE UTERINE MUCOSA AFTER DELIVERY.

The involution of the puerperal uterus is one of e most remarkable processes met with in the dy. It leads in the short space of six weeks to the duction in size of the uterus from that of an dominal tumour extending nearly to the level of e umbilicus at the end of the third stage of labour dimensions which differ very little from those of e virgin uterus. The process is of necessity complex d much of it is but little understood. Histological vestigations are handicapped by scarcity of material, r it is only rarely that uninfected specimens are tained. The involution of the muscle-fibres nsists of a granular atrophy without fatty degenera-on and there is no evidence that individual fibres e absorbed. The involution of the vessels is ifficult to interpret, and at the present time the ntradictory views of Goodall[3] and Wilfred Shaw[4] e disputed. More is known of the regeneration of e mucous membrane of the uterus, for Teacher's[5] ntribution in 1927 cleared up some of the difficulties. he late Prof. Whitridge Williams[6] shortly before his eath called attention to the involution of the lacental site and based his views upon the study of ghteen uninfected puerperal uteri. It is well known at the placental site is sometimes difficult to lentify immediately after delivery, but within a w hours, probably owing to the relaxation of the terus, its sinuses become engorged with blood. he sinuses become thrombosed and are then readily ecognised by their vascularity; moreover the lacental site projects above the general surface of he lining membrane of the uterus. Involution of he placental site proceeds until by the end of the ixth week after delivery the endometrium lines the nucous membrane of the uterus completely, and nacroscopical examination reveals little trace of the ituation of the placental site. The mechanism of he renovation of the rest of the endometrium is elatively simple. The line of cleavage between the nembranes and the uterus is through the spongy ayer of the decidua, and after expulsion of the placenta nd membranes a raw area remains which oozes lood and serum. The superficial part of this zone ecomes infiltrated with leucocytes, and by necrosis he remnants of the spongy layer are shed to form art of the lochial discharge. The cells of the basal ayer of the glands then grow over the denuded rea in a way which is comparable to the process f repair after menstruation. The most striking eature of the renovation is its rapidity, and Whitridge Williams was able to confirm the accepted view that involution of this part of the endometrium is completed by the third week of the puerperium. The involution of the placental site zone is, as might be expected, much more intricate, and six weeks elapse before the placental site is covered by endometrium. Whitridge Williams showed that leucocytic infiltration and necrosis can be demonstrated in the superficial layers in the first two weeks of the puerperium, and that this zone is shed in a way similar to that obtaining over the rest of the endometrium. The thrombosed sinuses and vessels develop hyaline tissue in their walls and are reduced in size partly by subendothelial proliferation and partly by absorption of the hyaline tissue. The main point of Whitridge Williams's thesis is that the bulk of the placental site is actually exfoliated during the fourth and fifth weeks of the puerperium. Exfoliation is produced as a result of the activity of the adjacent endometrium which undermines the placental site and detaches it from the wall of the uterus. This mechanism is assisted by the hypertrophy *of the fragments of the basal layer of the* endometrium which lie between the placental site and the wall of the uterus. The evidence which is brought forward is fairly convincing, and the only difficulty in accepting the explanation is that there is not a characteristic uterine discharge at this phase of the puerperium. It is interesting to notice that the only previous observations on the puerperal uterus which suggest a similar mechanism are those of Ries which were published some forty years ago. The histology of the involution of the puerperal uterus is worth further study.

CARDIOLOGICAL DIAGNOSIS.

Two useful pamphlets[1] have recently been published by the heart committee of the New York Tuberculosis and Health Association. They deal with the criteria for the interpretation of electrocardiograms, and with radiological diagnosis in heart disease. One of the principal objects of the Association is to achieve a standard nomenclature and thereby render comparable the results obtained by different workers. Such uniformity would also facilitate the study of cardiological problems from the statistical aspect. In the pamphlet dealing with electrocardiography 50 variations in the form of the record are described. Of these, 27 are concerned with the heart's rhythm, three with deviation of the electrical axis, and the remainder with the form of the different deflexions which constitute the auricular and ventricular complexes. The list of phenomena considered includes all the common deviations from the normal, and the only feature which might, perhaps, be regarded as an unnecessary refinement is the subdivision of the duration of the Q R S complex into three (short, medium, and long) instead of the usual two types (less than and greater than 0·1 sec.). The pamphlet is illustrated by a series of typical records. The pamphlet on Radiologic Diagnosis in Heart Disease opens with a simple and lucid account of the methods of procedure. It then deals with the diagnosis of enlargement of the various cardiac chambers and of the aorta, stress being laid on the fact that it is much more important to ascertain which chambers of the heart are involved rather than to obtain an exact measurement of the size of the whole heart. In place of actual radiograms a series of 31 line diagrams are given. These serve to illustrate clearly the various features described in the text. In the preface Dr. Alfred E. Cohn points out that this is merely a tentative effort at classification, and necessarily incomplete; but that the authors are to be congratulated on producing such a helpful introduction to a difficult subject.

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[2] Amer. Jour. of Surg., December, 1931, p. 591.

[3] Goodall, J. R.: Studies from Royal Victoria Hospital, Montreal, 1910, ii., No. 3.

[4] Shaw, Wilfred: Jour. Obst. Gyn. Brit. Emp., 1929, xxxvi., 1.

[5] Teacher, J. H.: Ibid., 1927, xxxiv., 1.

[6] Williams, Whitridge: Amer. Jour. Obst. Gyn., 1931, xxii., 664.

[1] Criteria for the Interpretation of Electrocardiograms. Guide to Radiologic Diagnosis in Heart Disease. New York Tuberculosis and Health Association. 1931.

THE TREATMENT OF PRURITUS SENILIS.

THE ætiology of pruritus senilis is frequently obscure. It is not an uncommon symptom, and is one of the most lamentable and intractable of the penalties of old age. The hypothesis of essential skin changes of a degenerative type, with loss of elastic fibres, is no longer tenable, for the large majority of individuals with senile atrophic skin do not have pruritis. It is essential in every case to exclude such obvious causes as pediculi, cystitis with an enlarged prostate, strictures, and latent carcinoma, especially of the liver. Dr. H. Abelson,[1] of Leipzig, believes he has established another factor in a metabolic undernourishment of the cutis due to senile changes in its circulation—i.e., a cutaneous arterio-sclerosis. For many years he has always given iodine to such patients with benefit, and for the last six months has obtained encouraging results with a skeletal muscle extract—lacarnol. This drug—the main indication for which is angina—is quite harmless, and is prescribed in drop doses on sugar, up to 12 or 15 drops t.d.s. In eight of Abelson's cases there was so much improvement in a week that the patients are stated to have forgotten to apply local antipruritics. Further benefit was obtained by 1 c.cm. injections hypodermically twice a week. This group of cases and three more were completely cured of itching in four weeks, but in a third group of 12 cases this happy result was not secured, and the patients had to continue to seek relief by local measures after a six weeks' trial of lacarnol. The element of suggestion cannot easily be excluded, especially in such a small series of cases, but the good results in nearly half the cases suggest a trial of this method.

PRIMARY CARCINOMA OF THE LUNG.

THE recent increase in the number of cases of primary carcinoma of the lung may not be real, but certainly more cases are being reported. Dr. B. M. Fried, in a clinical and pathological study,[2] states his opinion that the increase is due to more accurate diagnosis, the fact that attention has been focused on the condition, and an increase in the span of human life. Though this is a comforting suggestion, autopsy reports from the large hospitals cannot be ignored. James Maxwell from London, J. B. Duguid from Manchester, W. Kikuth from Germany, and C. V. Weller from America, and other workers report a definite and steady increase in the percentage of carcinomata of the lung seen at autopsies, and also an increased proportion in relation to the total number of malignant growths. Maxwell notes that "the thorax is assuming increasing importance as a primary site of malignant disease." Dr. Fried reviews again the possible ætiological factors that have been blamed, such as influenza, tarred roads, tuberculosis, syphilis, and trauma, but has to reject each in turn. If more space in the literature on bronchial carcinoma were given to diagnosis, especially early diagnosis, and less on histogenesis and metastases, the average medical reader would be grateful. Dr. Fried is not very helpful in this respect, but he does add one new idea of importance. He suggests that bronchial carcinoma frequently runs a protracted course, often of several years' duration, during which time the patient's symptoms suggest only a mild inflammatory disease of the bronchi. In Dr. Fried's view, practitioners are so obsessed with the terminal picture of this disease as seen in the post-mortem room that they are inclined to forget the onset: that two years before their patient started having bronchitis and that his sputum was occasionally streaked with blood. The difficulty facing the practitioner is that if he is to make an early diagnosis he must subject the patient to special examination, such as bronchoscopy and X rays, at a time when the complaint is only of what may appear trivial pulmonary symptoms. To wait nowadays for physical signs to develop before making a diagnosis of pulmonary tuberculosis is to deny to the patient the best chance of recovery; and this is true, also, of pulmonary cancer.

Directly opposed to the theories of Dr. Fried are those of Dr. Jacob Polevski.[3] He maintains that primary cancer of the lung can be diagnosed clinically by the characteristic history and physical signs, that fluoroscopy is of great aid in doubtful cases, but that bronchoscopy and biopsy are rarely necessary. This expectant attitude can hardly be justified, since progress cannot be anticipated unless active steps are taken to ensure early diagnosis. Dr. Polevski reports nine cases, all of which showed on the X ray a shadow extending out to the periphery of the lung. This is, unfortunately, the stage at the time many patients seek advice, but the absence of such pronounced signs by no means excludes cancer. Primary cancer of the lung originates in the bronchial mucosa near or around the hilum of the lung. X rays will not show any abnormal shadow until the growth has spread into the surrounding tissue, or, what is more frequent, has grown into and obstructed the lumen of the bronchus, causing atelectasis and pneumonitis in the obstructed area of the lung. It is only with the bronchoscope that we can hope to see the beginnings of this disease. Chevalier Jackson has so popularised bronchoscopy in the United States that the practitioner does not hesitate to recommend it to his patient any more than he would hesitate to advise cystoscopy in an obscure case of hæmaturia. More bronchoscopic clinics are needed in England, though it must be confessed that even with an early diagnosis the outlook is still gloomy. X ray therapy can offer only palliative treatment, while radium and partial pneumectomy are still in the experimental stage. The results of these are sufficiently encouraging to offer at least a slight hope for the future.

HEALTH OF THE ARMY IN 1930.

THE report[4] on the health of the Army in 1930, signed by Lt.-Gen. Sir H. B. Fawcus, Director-General, Army Medical Services, registers further advances in the struggle for scientific recognition, treatment, and prevention of disease in the Army. The report is concerned with 10,972 officers and 178,384 other ranks. The figures of illness which it records are nearly all lower this year, probably because there was no considerable outbreak of influenza in 1930. The admissions to hospital per thousand were 428·4 (468·5 in 1929), deaths 2·32 (2·45), finally invalided 9·28 (10·1), and constantly sick

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[1] Dermat. Woch., 1931, xciii., 1775.

[2] Medicine, 1931, x., 373.

[3] Arch. Intern. Med., 1931, xlviii., 1126.

[4] H.M. Stationery Office. 1932. pp. 151. 2s. 6d.

4·1 (26·12); the numbers of out-patients were also ss. 2524·9 daily (2742·6). Among the chief causes r admission to hospitals were digestive diseases her than those of liver and tonsils 55·1 (55·4) er thousand. injuries 52·8 (52·1), malaria 41·3 (41·2), flammation of areolar tissue 34·5 (34·7). venereal seases 34·5 (35·0). The admissions for dysentery, nd-fly fever, and scabies showed a slight increase; r influenza, enteric fever, pulmonary tuberculosis, nd pneumonia there was a slight decrease. he final invaliding rate was 9·28 (10·1). The chief ss of service is through gonorrhœa. The death-te of women is raised, apparently by increase in eaths from diseases of the generative system. other and child welfare committees are formed in ll large stations and are credited with excellent work. he slight increase in dysentery is thought to be ue to better diagnosis of cases formerly returned as olitis or diarrhœa. In India some 80 per cent. of ses of dysentery are bacillary. but in Shanghai mœbic are the more numerous. Some epidemics of nteric fever are thought due to ambulant, nrecognised cases, perhaps styled "P.U.O." The revention of malaria in Shanghai has been difficult. he huts are on Chinese ground, surrounded by nals; the municipality oiled these. but the smell f the oil caused complaints from the neighbours. usting with Paris green was the method then tried, ut the neighbours' ducks ate that and died. Insect-ating fish were next procured, in the hope that they ould eat the larvæ. but this was a vain hope, for the ucks and their owners made joint onslaughts on the sh. Meantime malaria in the force at Shanghai as trebled. It looks as if the huts there will have o be mosquito-proofed. Screening of barracks roceeds in India. but only slowly. Plasmoquine s being tried and is giving satisfaction; in one roup of 233 cases there were only five relapses. he case-mortality of pneumonia is the same as it as forty years ago (10 per cent.). There is much ess invaliding for middle-ear diseases since electrically ighted otoscopes have been supplied to recruiting nedical officers. There were removed from knee-joints 38 internal. 28 external semilunar cartilages. and ll the patients returned to duty. Two cases of ysticercosis are reported, and several of oriental ore occurred at Quetta. The care with which the hysical training of the recruit is conducted deserves very praise. To test the effect of tobacco-smoking n endurance. a three-mile run was held among 1885 men in 19 races; of the non-smokers 18·7 per cent. got into the first ten places, of the moderate smokers 8·4. of the heavy smokers only 6·2. It is said that practically all recruits are total abstainers. Tuber-culosis continues to cause permanent loss to the service. 231 cases, with 31 deaths, 200 finally invalided, the percentage increasing with age and service. Bacteriological examinations are proving more and more effective as aids in diagnosis and treatment in the Army, and this fact provides one of the most encouraging features of this interesting report.

PATHOLOGY OF ENDOTHECAL INJECTION.

LITTLE is known of pathological changes which may be caused in the spinal cord by injections for spinal analgesia. It is true that now and then reports appear of neurological symptoms attributed to endothecal injections, but these are extremely rare, and actual post-mortem evidence of spinal cord damage is rarer still. Experimental proof of changes brought about in the nervous tissue of the cord when endothecal injections were made in dogs is now provided.[1] The authors describe and figure changes in the ganglion cells of the grey matter of the cord similar to those seen in Wallerian degeneration, swelling and fragmentation of axis cylinders. and signs of degenerative changes in the tracts of the cord. The dogs were killed at various periods, and after injections of various strength. The investigators point out that the last of these changes were not pronounced in cords of animals allowed to live for 90 days. It is possible that all the changes described were transitory. We anticipate with interest the fulfilment of the authors' hope that their studies may be extended to the cords of human beings. and the results incorporated "with those clinical observations which have been made in careful neurologic examination of patients operated on under spinal analgesia."

THE DECLINE IN THE MORTALITY FROM TUBERCULOSIS.

THE mortality from tuberculosis has been declining steadily in this country since 1866, with one notably exceptional period during the war years. As the Registrar-General's annual reports show, the standardised death-rate from all forms of tubercle for the decennium 1851–60 was 3478, while in 1929 it was 932 per million of the population. The corresponding figures for the pulmonary form of disease were 2772 and 738. The fall in the death-rate from non-pulmonary tuberculosis has not been so continuous as that observed for the pulmonary form. lagging till 1891 and then dropping with remarkable acceleration during the succeeding twenty years. So far as existing records reveal the true state of affairs. there appears to have been no decline in the curve between 1855 (when registration commenced) and 1866. Judging from the available information it may be conjectured that there was probably a rise in mortality from tuberculosis in the first half of the nineteenth century. concurrently with the increase in the general mortality-rate which seems to have occurred during that period.

At a meeting held on Jan. 15th the Society of Medical Officers of Health discussed the causes of these phenomena. The subject was introduced by two officers engaged in the tuberculosis service. Dr. Lissant Cox in Lancashire and Dr. E. Ward in Devonshire, their respective areas differing considerably in character and population. There was little difference of opinion on the broader aspects of the question either between them, or among most of the subsequent speakers. It seemed to be generally accepted that the raising of the standard of living, with consequent improvement of nutrition, was a prime cause of the decline of tubercle, and that reduction of overcrowding in houses, better sanitation, improved habits of cleanliness of the people as the result of better education. better working conditions, and improvement of the milk-supply were among the reasons for the fall in mortality before specific schemes for the prevention and cure of tuberculosis came into action. It was not forgotten that segregation of the advanced case, and therefore the limitation of mass infection, came into play long before the National Insurance Act of 1911, and the Tuberculosis Regulations of 1912 inaugurated the tuberculosis schemes of county and county borough councils; the steadily increasing hospital accommodation of the guardians was being extensively utilised for this purpose. Hardly a doubt was raised about the value of the now well-established schemes of early diagnosis, surveillance of contacts, specific forms of treatment in and outside of sanatoriums, hospitalisation of the advanced cases, and education of patients in methods of preventing the spread of infection. There is, indeed, some evidence that the death-rate has fallen more rapidly in recent years in those towns which have made the most extensive institutional provision. The continued application and perfection of these measures is a commitment of modern civilisation, but their actual share in the cause of the decline of mortality of tuberculosis is difficult to detect, as Prof. E. L. Collis pointed out. Indeed, there were murmurs of assent when Sir StClair Thomson asked whether tuberculosis might not be dying out of its own accord. This is perhaps really a suggestion that sudden migrations and increases of population such as occurred one hundred years ago, followed by relative stabilisation of town and country stocks and a falling birth-rate, may have had more to do with the rise and fall of tubercle than the less definitely social considerations which bulk large in the medical mind. It is at least gratifying to observe that the decline has continued with hardly any arrest of the rate of acceleration (except in the case of pulmonary tuberculosis in females aged 15–20 years) during the past ten years of increasing financial embarrassment.

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[1] Davis, L., Haven, H., Givens, J. H., and Emmett, J.: Jour. Amer. Med Assoc, Dec. 12th, 1931, p. 1781.

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A Guaranteed Cure.

Advertisers who, to put money in their pockets, fer extravagant and ridiculous guarantees in respect their goods, cannot complain if a customer occa-onally takes them at their word. This happened the recent case of Wood *v.* Lektrik, Ltd., which, Mr. Justice Rowlatt's judgment is challenged in e Court of Appeal, is sure to find a place in the gal text-books as an illustration of various points the law of contract. The defendant company dvertised "New hair in 72 hours. Lektrik Electric omb. Great news for hair sufferers. What is *your* ouble? Is it grey hair? In ten days not a grey air left. £500 guarantee." Mr. Wood, the plaintiff, ought one of the advertised combs and followed the irections ("to get the full benefit you should use it r five minutes"). He used the comb night and orning and occasionally during the day at his fice as well, but the guaranteed cure of his greyness roved a failure. He sued for his £500 and won his ase, subject to a possible appeal. Some of the efendant company's points seem commercially rather ynical. Their first contention, that the so-called uarantee was a mere flourish, was rejected; the udge took it to be a serious statement. The second ontention was an attempt to throw over their own dvertisement as something framed by an advertising agency and not authorised by themselves. This slender defence was rejected also; they had paid the agency's bill and had never repudiated the advertisement, but had accepted the profit of whatever sales accrued therefrom. Thirdly, it was suggested that the guarantee of £500 merely guaranteed the repayment of the price of the comb (3*s.* 6*d.*) if the customer wanted his money back. It appeared that in other instances the advertisements had contained a coupon explaining this remarkable limitation; but, as there was no such coupon in the announcement which attracted Mr. Brown, the suggested limitation was inoperative. Next the defendants said there *could be no valid legal contract if there was impossibility of performance.* With unusual candour they adopted the position that their comb could really never do what the advertisement promised on its behalf. They correctly argued that no legal consequences arise if someone promises the impossible; but unfortunately the advertisement expressly precluded the idea of impossibility. The combs, it said, were used by all grades of society, including Royalty; "*not one has failed to do everything we claim for it.*" Moreover, the advertisement contained a picture of a man living at Forest Hill with his statement that his hair was very thin and going grey, but on the tenth day the greyness had gone entirely; "that Lektrik comb of yours has done the trick." Lastly, the defendants alleged that the plaintiff had not used the comb properly and that anyhow he had not proved that he had not got fresh hair growing from the roots. The judge was unimpressed by these arguments also. He held that the comb had failed in its operation and that the plaintiff, having complied with the advertisement, had made a valid contract and was entitled to the guarantee of £500.

Mr. Justice Rowlatt is known as a judge who decides upon first principles, and is but little swayed by the citation of leading cases. There is, as it happens, a leading case on the law of contract—Carlill *v.* Carbolic Smoke Ball Company—which is closely parallel. Some 40 years ago, when influenza was a greater novelty, a firm advertised the merits of its carbolic smoke ball, and offered £100 to anyone "who contracts the increasing epidemic influenza colds, or any disease caused by taking cold, after having used the ball three times daily for two weeks according to the printed directions." Mrs. Carlill used the smoke ball for several weeks, but contracted influenza. She sued for her £100 and won. The defendants said there was no contract because the firm had not been notified of the acceptance of its offer. The court held that the case resembled that of a reward offered for the recovery of lost property—anyone who performed the condition must be taken to have accepted the offer without further ado. As in the comb case, the defendants said the advertisement was a mere puff which no reasonable person would take seriously. But the advertisement had announced that the firm had deposited £1000 with the Alliance Bank to "show our sincerity in the matter." The plaintiff's victory in the carbolic smoke ball case was upheld by a strong Court of Appeal. Lord Justice Bowen agreed that ordinarily the acceptance of an offer must be notified to the offerer, in order that the two minds may come together and a valid contract be formed. But a person who makes an offer can expressly or impliedly intimate that a particular mode of acceptance will suffice to make the bargain binding. If so, it is only well-established schemes of early diagnosis, surveillance of contacts, specific forms of treatment in and outside of sanatoriums. hospitalisation of the advanced cases, and education of patients in methods of preventing the spread of infection. There is, indeed, some evidence that the death-rate has fallen more rapidly in recent years in those towns which have made the most extensive institutional provision. The continued application and perfection of these measures is a commitment of modern civilisation. but their actual share in the cause of the decline of mortality of tuberculosis is difficult to detect, as Prof. E. L. Collis pointed out. Indeed, there were murmurs of assent when Sir StClair Thomson asked whether tuberculosis might not be dying out of its own accord. This is perhaps really a suggestion that sudden migrations and increases of population such as occurred one hundred years ago, followed by relative stabilisation of town and country stocks and a falling birth-rate, may have had more to do with the rise and fall of tubercle than the less definitely social considerations which bulk large in the medical mind. It is at least gratifying to observe that the decline has continued with hardly any arrest of the rate of acceleration (except in the case of pulmonary tuberculosis in females aged 15–20 years) during the past ten years of increasing financial embarrassment.

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A Guaranteed Cure.

Advertisers who, to put money in their pockets, offer extravagant and ridiculous guarantees in respect of their goods, cannot complain if a customer occasionally takes them at their word. This happened n the recent case of Wood *v.* Lektrik, Ltd., which, f Mr. Justice Rowlatt's judgment is challenged in the Court of Appeal, is sure to find a place in the legal text-books as an illustration of various points of the law of contract. The defendant company advertised "New hair in 72 hours. Lektrik Electric Comb. Great news for hair sufferers. What is *your* trouble? Is it grey hair? In ten days not a grey hair left. £500 guarantee." Mr. Wood, the plaintiff, bought one of the advertised combs and followed the directions ("to get the full benefit you should use it for five minutes"). He used the comb night and morning and occasionally during the day at his office as well, but the guaranteed cure of his greyness proved a failure. He sued for his £500 and won his case, subject to a possible appeal. Some of the defendant company's points seem commercially rather cynical. Their first contention, that the so-called guarantee was a mere flourish, was rejected; the judge took it to be a serious statement. The second contention was an attempt to throw over their own advertisement as something framed by an advertising agency and not authorised by themselves. This slender defence was rejected also; they had paid the agency's bill and had never repudiated the advertisement, but had accepted the profit of whatever sales accrued therefrom. Thirdly, it was suggested that the guarantee of £500 merely guaranteed the *repayment of the price of the comb (3s. 6d.) if the* customer wanted his money back. It appeared that in other instances the advertisements had contained a coupon explaining this remarkable limitation; but, as there was no such coupon in the announcement which attracted Mr. Brown, the suggested limitation was inoperative. Next the defendants said there could be no valid legal contract if there was impossibility of performance. With unusual candour they adopted the position that their comb could really never do what the advertisement promised on its behalf. They correctly argued that no legal consequences arise if someone promises the impossible; but unfortunately the advertisement expressly precluded the idea of impossibility. The combs, it said. were used by *all grades of society, including Royalty*; "not one has failed to do everything we claim for it." Moreover, the advertisement contained a picture of a man living at Forest Hill with his statement that his hair was very thin and going grey, but on the tenth day the greyness had gone entirely; "that Lektrik comb of yours has done the trick." Lastly, the defendants alleged that the plaintiff had not used the comb properly and that anyhow he had not proved that he had not got fresh hair growing from the roots. The judge was unimpressed by these arguments also. He held that the comb had failed in its operation and that the plaintiff, having complied with the advertisement, had made a valid contract and was entitled to the guarantee of £500.

Mr. Justice Rowlatt is known as a judge who decides upon first principles, and is but little swayed by the citation of leading cases. There is, as it happens, a leading case on the law of contract—Carlill *v.* Carbolic Smoke Ball Company—which is closely parallel. Some 40 years ago, when influenza was a greater novelty, a firm advertised the merits of its carbolic smoke ball. and offered £100 to anyone "who contracts the increasing epidemic influenza colds, or any disease caused by taking cold, after having used the ball three times daily for two weeks according to the printed directions." Mrs. Carlill used the smoke ball for several weeks, but contracted influenza. She sued for her £100 and won. The defendants said there was no contract because the firm had not been notified of the acceptance of its offer. The court held that the case resembled that of a reward offered for the recovery of lost property—anyone who performed the condition must be taken to have accepted the offer without further ado. As in the comb case, the defendants said the advertisement was a mere puff which no reasonable person would take seriously. But the advertisement had announced that the firm had deposited £1000 with the Alliance Bank to "show our sincerity in the matter." The plaintiff's victory in the carbolic smoke ball case was upheld by a strong Court of Appeal. Lord Justice Bowen agreed that ordinarily the acceptance of an offer must be notified to the offerer, in order that the two minds may come together and a valid contract be formed. But a person who makes an offer can expressly or impliedly intimate that a *particular mode of acceptance* will suffice to make the bargain binding. If so, it is only necessary for the person to whom such offer is made to follow the indicated mode of acceptance. The Lektrik comb case was perhaps not so clear a case as that of the smoke ball, where Lindley, L. J., had no doubt that there was "a distinct promise expressed in language which is perfectly unmistakable." Undoubtedly the purchasing public allows for a little licence in the language of advertisements; otherwise the Lektrik Company's liability might be colossal. A director of the company told the court that approximately a million of the combs had been sold, and only four persons had claimed the £500.

Heavy Damages for a Doctor.

At Pembroke Assizes on Jan. 14th damages for slander amounting to £5000 were awarded to Dr. J. H. Owen, of Fishguard, medical officer of health to the Haverfordwest Rural District Council, against Mr. Cyril Hugh Barham, of Letterston, a member of the Pembrokeshire County Council. An injunction was also granted restraining him from repeating the slander. Mr. Barham tried to justify what he had said, but the judge told the jury that there was no evidence justifying the slander, and no proof whatever had been put before the court, by the defendant, of the statements he had made. The jury, after a few minutes' absence, found for Dr. Owen, with the damages stated above. Mr. Chappell, K.C., Mr. T. Carthew, and Mr. G. C. Richards (instructed by Messrs. Le Brasseur and Oakley), on behalf of the London and Counties Medical Protection Society, Ltd., appeared for the plaintiff and Mr. Barham conducted his own defence.

MENTAL DISORDER IN SCOTLAND.

THE seventeenth annual report of the General Board of Control for Scotland covers the year 1930, the first in which the former duties of district boards of control and parish councils were exercised by the county councils and town councils. The Board finds that the new authorities are taking an active interest and that there is every reason to hope that the care of the insane and mentally defective will continue on progressive lines. As a rule the lunacy and mental deficiency functions have been referred to the public health and public assistance committee, either jointly (ten cases) or partly to each (39 cases). They have been delegated to the public assistance committee alone in five cases and to a joint public health and lunacy and mental deficiency committee in one case.

Work of Voluntary Societies.—In the old days the vote of the General Board of Control included a sum of £750 towards the work of the societies assisting and supervising mental defectives outside institutions. These societies are of the utmost value. Supervision is carried out tactfully and unobtrusively, and children notified as incapable of receiving further benefit from instruction in a special class or school are followed up, and helped, as far as possible, in daily occupation centres. The associations also keep in touch with children over 16 discharged from special schools and classes. The Board was anxious that the voluntary associations should not have their work hampered in any way under the new Act, and issued a special circular to town and county clerks stressing the importance of maintaining the work, on account of its value to the defectives and of the economy it effected to the local authorities in reducing the necessity for institutional treatment. The local authorities were urged to ask the Department of Health to pay their contribution to the voluntary associations out of the amount payable as the general exchequer grant. The response of the local authorities was not, however, satisfactory, and the Board made a scheme under Section 64 of the Act. The Board also expresses the opinion that local authorities should have specific statutory powers to provide day occupation centres for defective children.

The report includes a brief review of the treatment of the mentally afflicted in Scotland, stressing especially the introduction and development of hospital care and nursing followed by occupational therapy. The great improvement in physical health has undoubtedly played its part in the improvement in mental health. It must be admitted, however, that this improvement is not reflected in the table given in the report; it appears that the recovery-rate in the quinquennium ending 1864 was 37 per cent. and in those ending 1874 and 1884 it reached as high as 41 per cent., while in 1930 it was only 33·9 per cent. The death-rate likewise was 8·2 per cent for the five years ending 1864 and sank as low as 7·7 per cent. in the five years ending 1879. For 1930 it was 8 per cent. The report attributes this statistical anomaly partly to the increase in voluntary patients, for whom no statistics are available.

The Board lays considerable stress upon the importance of the factor of generous accommodation, measured in floor space rather than in cubic space, as contributing to the general health of patients. When asylum accommodation was severely congested during the war, the death-rate rose considerably and the recovery-rate dropped. The Board considers that each patient should have 30 sq. ft. of floor space in the day-room, 60 sq. ft. in the dormitory, and 90 sq. ft. in hospitals and single rooms. This standard is often found too high in institutions where economy has reigned, during the war and post-war years, while the number of patients has steadily increased. The Royal Asylums alone show a surplus of accommodation. In the district asylums there is little if any margin and often a serious deficit on the Board's minimum. The overcrowding is partly due to the presence of over 2000 mental defectives in asylums for the insane and also to the presence of patients who could quite satisfactorily be boarded out with suitable guardians or in less expensive types of institution. The Board hopes that the demand for asylum accommodation may be decreased, first, by putting these patients in suitable accommodation, and secondly, by increasing the number of observation wards in poor-law hospitals for the treatment of mild and incipient mental disorder without certification.

On Jan. 1st, 1931, there were 19,241 insane persons in Scotland, an increase of 182 during the year. Voluntary patients admitted during the year numbered 734 and there were 972 such persons under care on Jan. 1st. There were 1406 pauper and 71 non-pauper patients provided for in private dwellings with the sanction of the Board, a decrease of 60 on the previous year. The visitors report that these boarded-out patients are extremely well and tactfully treated, although some of the guardians are quite aged persons. The death-rate of these patients was 1·27 per cent., and there was only one case of tuberculosis among them all. They have the benefit of light work on the crofts and farms, and it appears to be certain that no patient is overworked except in domestic service. The system seems to be equally successful for the defective, except that these patients are apt to be unsettled as a result of ill-judged letters or visits from relatives and also as a result of seeing other persons being paid a wage or a dole. One defective actually applied for discharge from certificate in order that he might apply for Government relief! All the visitors urge that greater advantage ought to be taken of this eminently satisfactory method of care.

On Jan. 1st there were 3299 certified mental defectives on the registers of the Board, an increase of 225 on the preceding year. During 1930, 112 aided mental defectives were certified and placed under guardianship.

OASTS RESORTS CONFERENCE AT TORBAY.

: CONFERENCE of medical men and others
ested mainly in the south-western coastal health
ts took place at the Paignton Palace Hotel
. Jan. 15th to 17th, under the chairmanship of
Alfred Goodson. Many medical officers of
th and practitioners from seaside towns in
on, Cornwall, and Somerset took part in the
tings, Lieut.-Colonel R. H. Elliot, Dr. Fortescue
, and Dr. W. S. C. Copeman being present on
alf of the London Provisional Committee on
st Resorts. The conference was largely attended
included representatives of the railway, hotel,
entertainments organisations, and those present
ned to be keenly alive to the importance of
ing immediate means to unite in a common
rt the various interests concerned. The merits
possibilities of the health and holiday resorts of
British coasts at all seasons were laid before the
ference in a series of addresses.

he aims of the Provisional Committee, as set forth
he memorandum presented to the meeting at the
titute of Hygiene in London on Jan. 11th, were
ussed and approved: These are as follows:—

To formulate the medical case for the British marine
th resorts in the prevention and cure of disease, and
differentiate on a scientific basis the various regions
places of the coast.

. To make this information known to the medical
ession and the public.

. To encourage due provision of medical requirements,
h as diet-prescriptions, adequate open-air shelters,
hs, and other treatment facilities, improved and reason-
e hotel accommodation, and other amenities.

. Whilst fully recognising the admirable progress effected
many municipal authorities and local medical associa-
ns on the coast in devising and providing such facilities,
coördinate and assist the efforts of these and other bodies,
where necessary to encourage the initiation of new
k.

. To consider the formation of a medical organisation
ich shall link together medical men on the British coast.

. As soon as practicable to establish in London a Central
reau for distribution of approved literature and for
nishing the necessary assistance, advice, and information
the public and to medical men—the British Spas Federa-
n and other organisations responsible for the health
orts of the country to be invited to coöperate in the
anisation of this Bureau.

. To promote regional conferences in the various areas
the coast.

. At the proper time, as may seem fit, to change the
me and enlarge the scope of the Association (the British
ast Resorts Association), in coöperation with organisa-
ns representing the spas and other British health resorts.

Members of the Committee pointed out that no
nd of medical or other organisation has hitherto
en framed to make known the attractions of the
ter ring of health and holiday resorts on the coasts
the British Islands; the spas were already organised.
ther speakers emphasised the educational value of
organisation dealing specifically with the coast
sorts, and of a permanent medical advisory body
London, and the need of a central bureau which
ould obtain the necessary medical data from the
calities and collate and edit the material for the
idance of the profession and the public.

Many speakers drew attention to the need for
proved and more reasonable accommodation at
aside places, also to the importance of abolishing
e unnecessary restrictions which at present hampered
eir development.

The following resolution was unanimously passed:

"That this Conference considers it a matter of urgency
at there should be formed a British Coast Resorts Associa-
on, and earnestly recommends to the Committee appointed at the meeting held under the chairmanship of Lord Riddell at the Institute of Hygiene. on Monday, Jan. 11th, 1932, that it should proceed to its establishment with the least possible delay."

IRELAND.

(FROM OUR OWN CORRESPONDENT.)

PROGRESS OF PUBLIC HEALTH.

THE report of the Department of Local Government and Public Health of the Irish Free State for 1929–30, recently issued, records a steady and satisfactory progress as regards activities bearing on health. The death-rate was 14·59 per 1000 of the population as compared with 14·84 for the preceding decade. The highest death-rates were in the county boroughs, the lowest in the almost purely rural areas. The death-rate from the principal epidemic diseases in county boroughs and towns with a population of over 10,000 was 0·96 per 1000 of the population, in contrast with 0·53 for the whole country and 0·38 for the rural areas.

In regard to the principal epidemic diseases typhus appears to have almost disappeared, only eight cases being notified during the year; on the other hand, there was an increase in enteric, 385 cases being notified, as compared with 304 in the previous year. The increase was almost altogether due to a severe outbreak at Carrick-on-Shannon, causing 80 cases, and due to water-borne infection. There was also an increase in diphtheria, which was nearly counterbalanced by a diminution in scarlatina. Immunisation against diphtheria has been extensively carried out in several counties.

In the year under review five county medical officers of health were appointed, six being already in office. (The number has since been considerably increased.) There has been a slight improvement in the maternal mortality associated with childbirth, the rate per 1000 births being 4·10, whereas the rate for the previous decade was 4·88. There is, however, an appalling mortality under this head in certain rural areas, reaching 7·78 per 1000 in Queen's County and 7·12 per 1000 in County Antrim. The report makes the definite statement that "the delay in appointing county medical officers of health . . . must be regarded as a contributing factor to the excessive mortality associated with childbirth in these counties." The infant death-rate showed a slight increase over the previous year, 70 per 1000 compared with 68, the increase being mainly due to the prevalence of respiratory diseases. The county boroughs still show a very high infant mortality—Limerick 116·7, Waterford 110·3, Dublin 106·2, and Cork 85·2. The mortality among illegitimate children is about five times that among legitimate children.

There was considerable development of medical inspection of school-children during the year, and this branch of preventive medicine has proved popular with the public, and has gained the coöperation of both parents and teachers. It is noted that, generally speaking, school hygiene and sanitation are in a backward condition, especially in rural districts. The atmosphere is often observed by the inspectors to be vitiated, clean sanitary accommodation to be lacking, lighting and heating insufficient, floors and windows dirty, and playgrounds inadequate. Increased use has been made of the School Meals Act. The death-rate from tuberculosis in 1929 was the lowest yet recorded for the country—1·32 per 1000 of the population. It is noted that so rapid has been the expansion of anti-tuberculosis activity in recent years that the number of patients under treatment under the several public schemes has doubled between 1923 and 1929.

Dealing with the administration of "medical charities," otherwise the dispensary medical service, the report states that in almost all counties graded scales of salaries for the medical officers have been adopted. It also states that use is being made by medical officers of the facilities given them for attending post-graduate courses. The facilities are hardly very attractive at present, as the medical officer going on study-leave has not only to pay all his expenses but also to provide a substitute at his own cost.

BERLIN.

(FROM OUR OWN CORRESPONDENT.)

SURPLUS BEDS IN HOSPITALS.

THE former shortage of beds in municipal hospitals in Berlin has now become a surplus, the number of in-patients having greatly decreased. The same position is reported from other cities, notably Dresden and Hanover, where respectively 39 per cent. and 26 per cent. of the available beds are unoccupied. One reason is that the Krankenkassen in order to save expenses are sending fewer patients to hospital than they used to do. Another reason is that the medical men engaged in club practice have less private practice than formerly, and are thus in a position to attend more club patients at home instead of sending them to hospital. Moreover, the fear of losing their employment has led many of the working people to prefer to be attended at home. The municipal authorities of Berlin as long ago as 1930 closed two hospitals which were reopened temporarily during the epidemic of influenza in January, 1931, but were closed again afterwards with two other municipal hospitals containing 2400 beds. In spite of these closures 15 per cent. of the beds in municipal hospitals are still empty, and even those private hospitals in which many wards have been closed for want of means are not full.

A NEW PATHOLOGICAL MUSEUM.

The Pathological Institute of the municipal Friedrichshain Hospital has been reorganised as a pathological museum. This museum was planned many years ago by the late Prof. Virchow. The large quantity of pathological specimens collected since the opening of the big municipal hospital in 1874 has now been systematically rearranged. The sections devoted to specimens of tuberculosis, cancer, syphilis, dysentery, and rickets, and of injuries, especially those caused by the war, are particularly complete; the total number of specimens amounts to 5000. In his opening address Prof. Pick, the director of the museum, pointed out the value of autopsies in confirming diagnosis in medico-legal work, and for insurance statistics as well as in the study of heredity problems.

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STORAGE OF RADIOGRAPHIC FILMS.

New regulations on the storage of radiograph films have been issued by the government. Accordi to those regulations films must not be kept in hospit wards, even in special cabinets. Smoking in roo where films are preserved is strictly prohibited, a the doors of storing rooms must always be kept clo No open fires are allowed and a fire extinguis must be kept in the room. Special regulati apply to film rooms in which more than 150 kg. films are stored. They must be kept immediat under the roof and the heating, electric installati and lightning conductors must conform to cert conditions. In rooms containing from 5 to 150 of films the films must be kept in special cabi and the precautions to be taken against fire explosion are set out in detail. A collection of f under 5 kg. in weight must be stored at a distanc at least 1 meter from the nearest heating appara The above regulations do not apply to so-called inflammable films.

MALNUTRITION OF CHILDREN.

Dr. Heimann has made a report to the Be Society for Public Health on an investigatio children recommended for a visit to a muni health resort. The children came from a dis of Berlin inhabited especially by working- people. Though they had no special disease weight and their height was far below the nor Apparently the wages of the parents do not cove cost of food and housing, and the childre unemployed persons suffer additional privat Housing conditions proved very unsatisfac In 53 cases four persons lived in a single room at and in some cases 14 persons in three rooms, so conditions of gross overcrowding existed. Dr. mann found the children's development to be reta The number of children sent to holiday resorts had to be much restricted, and since the maxi stay is six weeks no marked improvement is t expected.

TREATMENT OF ERYSIPELAS BY IODINE.

Dr. Meyerhof reports on the results obtained i Hamburg General Hospital by the treatmen erysipelas with tincture of iodine. The whole of the erysipelas and its surroundings were cov with a thick layer of a 10 per cent. tincture of io The application must be so dense that the skin ass a chocolate-like colour and must be renewed tw day until the fever subsides. Among 88 cases tre in this way the fever disappeared after only on two days in 66 per cent., the average duration of fever without treatment being six days. E cases died from complications.

CORRESPONDENCE

TISTICAL EXPRESSION OF RESULTS IN MEDICAL RESEARCH: TWO COMMON PITFALLS.

To the Editor of THE LANCET.

IR,—The statistics required for the convenient rding of results in medical research work are not complicated kind, but it not infrequently happens the interpretation of these statistics is rendered e the easier by an inappropriate method of ulating percentages.

et us take, as an example from laboratory work, investigation of the accuracy of a particular . How often are the results couched in the form, so many cases, so many positives were obtained which so many were incorrect." Or this may be reviated into, "So many per cent. of the positives e false positives." If left in that form, what do se results convey? Very little. For if, for mple, we are told that "5 per cent. of the posi- es were incorrect," it subtly suggests a necessary tion between the number of false positives and total number of all positives. But any relation ween them is really no more than an accidental . The true relation to be expressed is the one ween the number of cases giving *false positives*— , cases failing to give correct negatives—and the *l number of cases that should have given negative ults.* A reductio ad absurdum will make the tter clear. Suppose in the investigation of a test syphilis that 100 non-syphilitic cases—and only se cases—were tested, and suppose further that positive results (therefore *false* positives) were ained, would we return our results as "100 per t. of the positives were incorrect"? The absurdity bvious. What we really should say is "5 per cent. the non-syphilitic cases were incorrectly returned positive."

The second source of misunderstanding lies in the ference between statistical material obtained from perimental series and the material likely to occur actual practice. Again let a hypothetical example istrate the difficulty.

Two tests for syphilis, Test A and Test B, are der investigation, and the number of correct and correct results are expressed as percentages in the nner suggested above. The actual criterion of curacy, and the means of deciding which cases are philitic and which not, need not concern us here; may be based on clinical material, or the histories the cases, or the collateral use of other tests as ntrols. Let us suppose the results worked out as llows :—

rrect results.	Syphilitics.	Non-syphilitics.	Average.
ith Test A..	93 per cent. ..	99 per cent. ..	96 per cent.
" " B..	98 " " ..	98 " " ..	98 " "

Let us not run away with the idea that Test A will eld more errors than Test B. For Test A will only eld more errors than Test B *as long as the number of philitics and non-syphilitics are equal.* But will ey ever be equal in actual practice? Most likely t. And if these tests are investigated for the urpose of applying them as a routine to all such ses as are found in ordinary practice, or in a general ospital, or in a mental hospital (to mention a few ssibilities), it is more likely that the material will clude, not 50 per cent. of syphilitics, but something ke 10 per cent.

On that assumption of 10 per cent. syphilitics, it would mean that in a series of 1000 cases, the errors with Test A would be 7 per cent. of 100, plus 1 per cent. of 900, that is, 16 cases, or 1·6 per cent. Those with Test B would work out at 2 per cent. of 100, plus 2 per cent. of 900, that is, 20 cases, or 2 per cent. This shows that *in actual practice* Test A would yield, not more, but *less* errors than Test B.

All this is elementary enough, and one would hesitate to mention these pitfalls were it not for the hope that such mention might assist towards a greater uniformity in recording results. It may be argued that where detailed figures are given it is an easy matter to work out the required facts for oneself; but in these days of increased and rapid output of research, anyone who has to work through many references in a short while would be considerably assisted were the statistical results invariably given in a form that would express the true state of affairs, instead of one that is not only of little value but which may, to the unwary, prove misleading.

I am, Sir, yours faithfully,

J. ERNEST NICOLE.

Winwick Mental Hospital, Jan. 17th, 1932.

THE CEREBRO-SPINAL FLUID PRESSURE IN CASES OF HEAD INJURY.

To the Editor of THE LANCET.

SIR,—At a discussion at the Royal Society of Medicine on the Diagnosis and Treatment of Head Injuries reported in THE LANCET of Dec. 12th, 1931, it seemed to me that quite an unwarranted degree of importance was attached by most of the speakers to the pressure of the cerebro-spinal fluid. The matter is raised again by Dr. C. M. Hinds-Howell in the paper on Trauma and the Nervous System which appeared in THE LANCET last week.

At the discussion one of the opening speakers said that he decided not to operate on a case in which he suspected intracranial hæmorrhage, because the cerebro-spinal fluid pressure was not markedly raised. As long, however, as there is no interference with the circulation of the cerebro-spinal fluid, mere increase in the volume of the other intracranial contents does not produce any significant rise in the pressure. Thus, though a large hæmatoma may be present the cerebro-spinal fluid pressure may remain within normal limits. Another closely related fact is that *local* cerebral compression (by which hæmorrhage often causes its symptoms) is independent of the general intracranial pressure. The following example from my own experience illustrates this point. In a fatal case a large subdural hæmatoma compressed the underlying cerebral hemisphere, causing gross deformity; yet the general intracranial pressure was only 80 mm. Aq. In a case in which subarachnoid hæmorrhage resulted from a fall and produced a clinical picture of local cerebral compression, the cerebro-spinal fluid pressure was under 180 mm. Aq. In another case of subdural hæmatoma, in which depression of the cerebral hemisphere was seen at operation, the pressure was 150 mm. Aq.

In cases of head injury the pressure is often raised when there is no hæmorrhage and it is apparent from what I have said that it may be within normal limits and even low when hæmorrhage is present. The pressure reading has therefore little diagnostic value in the very cases in which, because of the necessity for operation, help in diagnosis is most required.

has been the expansion of anti-tuberculosis activity in recent years that the number of patients under treatment under the several public schemes has doubled between 1923 and 1929.

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under the roof and the heating, electric installa
and lightning conductors must conform to co
conditions. In rooms containing from 5 to 15
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Society for Public Health on an investigati
children recommended for a visit to a mun
health resort. The children came from a d
of Berlin inhabited especially by working
people. Though they had no special disease
weight and their height was far below the n
Apparently the wages of the parents do not cov
cost of food and housing, and the childr
unemployed persons suffer additional priva
Housing conditions proved very unsatisfa
In 53 cases four persons lived in a single room a
and in some cases 14 persons in three rooms, s
conditions of gross overcrowding existed. Dr
mann found the children's development to be ret
The number of children sent to holiday resor
had to be much restricted, and since the ma
stay is six weeks no marked improvement is
expected.

TREATMENT OF ERYSIPELAS BY IODINE.

Dr. Meyerhof reports on the results obtained
Hamburg General Hospital by the treatme
erysipelas with tincture of iodine. The whol
of the erysipelas and its surroundings were c
with a thick layer of a 10 per cent. tincture of
The application must be so dense that the skin as
a chocolate-like colour and must be renewed t
day until the fever subsides. Among 88 cases t
in this way the fever disappeared after only
two days in 66 per cent., the average duration
fever without treatment being six days.
cases died from complications.

CORRESPONDENCE

TISTICAL EXPRESSION OF RESULTS IN MEDICAL RESEARCH: TWO COMMON PITFALLS.

To the Editor of THE LANCET.

R,—The statistics required for the convenient ding of results in medical research work are not complicated kind, but it not infrequently happens the interpretation of these statistics is rendered the easier by an inappropriate method of lating percentages.

t us take, as an example from laboratory work, investigation of the accuracy of a particular How often are the results couched in the form, so many cases, so many positives were obtained hich so many were incorrect." Or this may be eviated into, "So many per cent. of the positives false positives." If left in that form, what do e results convey? Very little. For if, for nple, we are told that "5 per cent. of the posi- s were incorrect," it subtly suggests a necessary ion between the number of false positives and total number of all positives. But any relation een them is really no more than an accidental The true relation to be expressed is the one een the number of cases giving *false positives*— cases failing to give correct negatives—and the *number of cases that should have given negative ts.* A reductio ad absurdum will make the ter clear. Suppose in the investigation of a test syphilis that 100 non-syphilitic cases—and only e cases—were tested, and suppose further that positive results (therefore *false* positives) were ined, would we return our results as "100 per . of the positives were incorrect"? The absurdity vious. What we really should say is "5 per cent. he non-syphilitic cases were incorrectly returned positive."

he second source of misunderstanding lies in the rence between statistical material obtained from rimental series and the material likely to occur ctual practice. Again let a hypothetical example trate the difficulty.

wo tests for syphilis, Test A and Test B, are er investigation, and the number of correct and rrect results are expressed as percentages in the nner suggested above. The actual criterion of racy, and the means of deciding which cases are hilitic and which not, need not concern us here; ay be based on clinical material, or the histories he cases, or the collateral use of other tests as trols. Let us suppose the results worked out as ows:—

ect results.	Syphilitics.	Non-syphilitics.	Average.
h Test A..	93 per cent. ..	99 per cent. ..	96 per cent.
„ B..	98 „ „ ..	98 „ „ ..	98 „ „

et us not run away with the idea that Test A will d more errors than Test B. For Test A will only d more errors than Test B *as long as the number of hilitics and non-syphilitics are equal.* But will y ever be equal in actual practice? Most likely . And if these tests are investigated for the pose of applying them as a routine to all such es as are found in ordinary practice, or in a general pital, or in a mental hospital (to mention a few sibilities), it is more likely that the material will lude, not 50 per cent. of syphilitics, but something 10 per cent.

n that assumption of 10 per cent. syphilitics, it would mean that in a series of 1000 cases, the errors with Test A would be 7 per cent. of 100, plus 1 per cent. of 900, that is, 16 cases, or 1·6 per cent. Those with Test B would work out at 2 per cent. of 100, plus 2 per cent. of 900, that is, 20 cases, or 2 per cent. This shows that *in actual practice* Test A would yield, not more, but *less* errors than Test B.

All this is elementary enough, and one would hesitate to mention these pitfalls were it not for the hope that such mention might assist towards a greater uniformity in recording results. It may be argued that where detailed figures are given it is an easy matter to work out the required facts for oneself; but in these days of increased and rapid output of research, anyone who has to work through many references in a short while would be considerably assisted were the statistical results invariably given in a form that would express the true state of affairs, instead of one that is not only of little value but which may, to the unwary, prove misleading.

I am, Sir, yours faithfully,
J. ERNEST NICOLE.

Winwick Mental Hospital, Jan. 17th, 1932.

THE CEREBRO-SPINAL FLUID PRESSURE IN CASES OF HEAD INJURY.

To the Editor of THE LANCET.

SIR,—At a discussion at the Royal Society of Medicine on the Diagnosis and Treatment of Head Injuries reported in THE LANCET of Dec. 12th, 1931, it seemed to me that quite an unwarranted degree of importance was attached by most of the speakers to the pressure of the cerebro-spinal fluid. The matter is raised again by Dr. C. M. Hinds-Howell in the paper on Trauma and the Nervous System which appeared in THE LANCET last week.

At the discussion one of the opening speakers said that he decided not to operate on a case in which he suspected intracranial hæmorrhage, because the cerebro-spinal fluid pressure was not markedly raised. As long, however, as there is no interference with the circulation of the cerebro-spinal fluid, mere increase in the volume of the other intracranial contents does not produce any significant rise in the pressure. Thus, though a large hæmatoma may be present the cerebro-spinal fluid pressure may remain within normal limits. Another closely related fact is that *local* cerebral compression (by which hæmorrhage often causes its symptoms) is independent of the general intracranial pressure. The following example from my own experience illustrates this point. In a fatal case a large subdural hæmatoma compressed the underlying cerebral hemisphere, causing gross deformity; yet the general intracranial pressure was only 80 mm. Aq. In a case in which subarachnoid hæmorrhage resulted from a fall and produced a clinical picture of local cerebral compression, the cerebro-spinal fluid pressure was under 180 mm. Aq. In another case of subdural hæmatoma, in which depression of the cerebral hemisphere was seen at operation, the pressure was 150 mm. Aq.

In cases of head injury the pressure is often raised when there is no hæmorrhage and it is apparent from what I have said that it may be within normal limits and even low when hæmorrhage is present. The pressure reading has therefore little diagnostic value in the very cases in which, because of the necessity for operation, help in diagnosis is most required.

It should, perhaps, be added that neither of these patients was willing to become a voluntary patient in a mental hospital, and that there seemed to be no justification for their compulsory detention.

I am, Sir, yours faithfully,
J. B. STRAFFORD LEWIS.

Banstead Mental Hospital, Sutton, Surrey,
Jan. 16th, 1932.

EXTRACT OF SUPRARENAL CORTEX.

To the Editor of THE LANCET.

SIR,—In a paper on three cases of Addison's disease treated with an extract of suprarenal cortex which appeared in THE LANCET of Jan. 16th, Dr. Benham and his colleagues state that the extract of suprarenal cortex used in the treatment contained definitely a small trace of protein amounting to not more than 10 mg. per 100 c.cm.

I would like to point out that the evidence for the presence of even so small a quantity of protein in Eucortone (A. & H.) (which was used in the treatment of the above cases) is very doubtful. In the first place the method of extraction with 80 per cent. alcohol followed by benzene makes it extremely unlikely that protein, even in traces, would be present. Swingle and Pfiffner[1] stated that their extracts gave negative results with the biuret, Hopkins-Cole, Molisch, and Liebermann-Burchard reactions, but positive with the xanthoproteic, Millon's, and alkaline phosphotungstate reactions. The latter are attributed to the presence of phenolic decomposition bodies of adrenalin. Eucortone gives exactly the same results as the above. Moreover, when eucortone is salted out with ammonium sulphate, the small amount of precipitate obtained gives even more indefinite results for the presence of protein. The total nitrogen in eucortone has never exceeded 0·02 per cent., and is usually about 0·01 per cent.

I am, Sir, yours faithfully,
NORMAN EVERS, B.Sc., F.I.C.,
Chief Chemist, Allen and Hanburys, Ltd.

Bethnal Green, London, E., Jan. 19th, 1932.

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[1] Amer. Jour. Phys., 1931, xcviii. (i), 144.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE.

Surg.-Comdr. J. S. Orwin is placed on the retd. list with rank of Surg. Capt.

The following appointments are notified: Surg.-Comdr. H. F. Briggs to R.A.F. Hospital, Portland; Surg. Lt. F. M. Duthie to *Aphis*.

ROYAL ARMY MEDICAL CORPS.

Capt. G. de N. U. Somers relinquishes his temp. commn.

Capt. T. W. Davidson from the secd. list is restd. to the estabt.

TERRITORIAL ARMY.

Maj. D. H. Coats, R.A.M.C., to be Divl. Adjt., 51st (Highland) Div., vice Maj. W. Campbell, R.A.M.C., vacated.

Capt. J. G. E. Vachell, R.A.M.C., to be Divl. Adjt., 49th (W. Riding) Div., vice Maj. E. J. S. Bonnett, R.A.M.C., vacated.

Lt. C. de W. Kitcat to be Capt.

ROYAL AIR FORCE.

Air Commodore H. V. Wells has been appointed P.M.O., Air Defence of Gt. Britain.

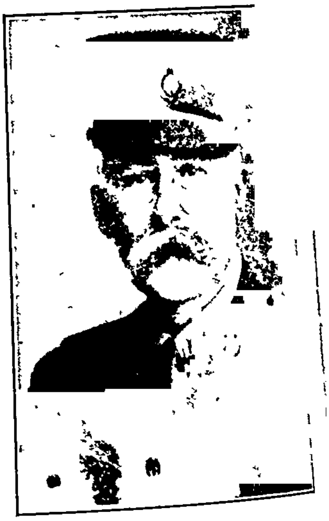
FOOD EDUCATION SOCIETY.—Dr. Richard Ackerley will lecture on Diet and Personal Hygiene at 29, Gordon-square, W.C.1, at 5 P.M., on Wednesdays, Feb. 10th, 17th, and 24th. Tickets may be had from the Hon. Secretary of the society, at that address.

OBITUARY

JAMES CALVERT, M.D., B.Sc., F.R.C.P.,

CONSULTING PHYSICIAN TO ST. BARTHOLOMEW'S HOSPITA

WE recorded last week the death of Dr. Ja Calvert on Jan. 13th, which occurred unexpect at the age of 76, and has left a deep sense of on many friends.



DR. JAMES CALVERT.

[*Photograph by Elliott & Fry*

James Calvert, the son of the late Edward Ca of Stonerigg, Cumberland, was educated priv and proceeded, at a rather later age than is usual with students, to the medical school at St. Bartholomew's Hospital, having graduated as B.A., B.Sc., in the University of London. He was very successful in the school, and obtained first-class honours in the examination for the M.B. Lond. in 1885, and proceeded as early as possible to the M.D. degree. He filled the usual junior appointments at his hospital, and in particular had a long experience as a pathologist and in the post-mortem room. In 1902 he was electe assistant physician and soon afterwards lecturer o materia medica, pharmacology, and therapeutic He thus established a reputation among students a practical teacher, while his quiet humorous mann appealed to them. In 1895 he was elected F.R.C. and in the following year he became Warden of t residential college at St. Bartholomew's, a positi which he filled with great success for a consideral period. In 1913 he became full physician to hospital and lecturer on medicine in the medi school. He had in the meantime been elec physician to the Royal Chest Hospital in the Ci road, an appointment which influenced his prac in a marked manner. He was a thoroughly g clinician, making full use of his accurate knowle as a morbid anatomist and his special familia with diseases of the chest, and both as lecturer bedside teacher achieved a sound reputation wi and without the walls of his own hospital. He appointed examiner in medicine at different ti to the Universities of London and Liverpool, at the Royal College of Physicians of London, w he held the post of censor.

On the outbreak of the war Calvert became se medical officer and chairman of the medical b at the 1st London General Hospital, at Camber with the rank of Lieut.-Colonel R.A.M.C.(T.). discharged the duties with marked efficiency, in this capacity was appointed to conduct an in into a serious outbreak of influenza which occurr the Crystal Palace at the end of 1918; about men out of an average number of 5600 statione the Palace having sickened with the disease, 1 ied from associated pneumonia. At the the war, he received the C.B.E. for his

rt was an infrequent writer, but his contribu- the literature of the two sides of his professional iich personally interested him were of practical He wrote the article on Prescribing in son's and Collier's Index of Treatment; t. Bartholomew's Reports he was an occasional itor, while clinical reports made by him will d in the Transactions of the Clinical Society, he old Royal Medical and Chirurgical Society. the duties which he undertook Calvert was rthy, while he discharged them with extreme tion, his slow manner and quiet humour being eristic of him. He was in hospital affairs irable colleague.

Calvert married Therèse, the eldest daughter ate Mr. John Smithers, and one of his daughters . Sir Eric Stewart Taylor, M.D., the son late Sir Frederick Taylor, formerly President Royal College of Physicians of London.

HUGH S. DAVIDSON, O.B.E., M.B., F.R.C.S. Edin.

Mr. Hugh Davidson, who died on Jan. 5th after curling at an ice-rink, was one of the most competent and popular members of the medical profession in Edinburgh. He was a good shot and an adept in billiards and tennis, and the physical dexterities that drew him to those games were an asset in his training and practice as a gynæcological surgeon. He graduated as M.B. in 1903 with first-class honours, and became F.R.C.S. Edin. in 1906. He studied for a period at Prague and at Vienna. He had the usual "resident" experiences of a specialist in training, and at the time of his death had become gynæcologist to the Royal Infirmary, physician to the Royal Maternity and Simpson Memorial Hospital, and to the Women's Hospital in Archibald-place. Formerly also he was on the staffs of the Deaconess Hospital and the Chalmers' Hospital. Two years ago he held office as President of the Obstetrical Society. He was recognised as a clever diagnostician. a sound operator, and an excellent teacher.

PUBLIC HEALTH SERVICES

UAL REPORTS OF MEDICAL OFFICERS OF HEALTH.

following are 1930 statistics of Kent, Durham, lshire, and Cheshire.

		Death-rates per 1000 of the population.					Death-rates per 1000 births.		
e of t and ated G.) ear tion.	Birth-rate.	All causes.	Tuberculosis.	Cancer.	Respiratory diseases with influenza.	Heart disease.	Infant and neonatal mortality.	Young child (1–5 yr.) mortality.	Maternal mortality in childbirth.
. . ,100)*	15 2	10·9	0 82	1·53	1·1	2·4	45/–	15	3·9
. . ,540)†	20·9	11·2	1·06	1·09	1·6	1·4	73/–	33	5·8
shire),380)*	18·6	10·9	0 82	1·28	1·6	1·9	64/–	—	3·4
. . ,100)*	14·7	11·1	0·65	1·51	1·3	2·3	56/–	27	4·6

) estimates. † 1929 estimates. Provisional 1931 Census Kent 1,194,115, Durham 924,050, Staffordshire , Cheshire 675,190.

tered stillbirths per 100 live births: Kent 3·3, Durham 4·5, lshire 4·4, Cheshire 4·8.

Kent.

A. Greenwood says 1930 was the first year in the infant mortality-rate has been lower in the than in the rural districts. He is disappointed he figures for maternal mortality. The puerperal rate was the highest since 1926, and the rate other accidents, &c., the highest since 1927. e V.D. clinics 35 per cent. of the syphilitic 3 per cent. of the gonorrhœa patients defaulted. is a tendency to make more use of the public ance hospitals, and in some areas accommoda- ias been found for acute cases by the transfer iers to the infirm wards of other institutions. ianges have been made in the out-relief system. cial scheme is in force in Dartford by which the formerly paid to the district medical officers ortioned among eight practitioners in accordance the work done. The poor-law institutions are the mixed type. The Tenterden institution been appropriated for mental defectives. work of the county pathological laboratories continues to increase, and the scheme for the treatment of crippled children operates satisfactorily. Mr. A. L. Moreton, F.R.C.S., who was in charge of the 80 beds at the Alexandra Hospital and of four out-clinics shows how the work has developed and increased. He advocates more frequent clinics, so that classes in remedial gymnastics and massage may receive more attention; and says the number of beds at the hospital should be increased. There is usually a waiting-list of some 20 to 40.

There has been a development during the year of antenatal clinics which are mostly staffed by a local practitioner with the assistance of the health visitor and district nurse for the area. These clinics now number 14. In 27 of the 39 sanitary districts which comprise the county council's child welfare scheme, whole-time health visitors act as infant life protection visitors and in the remaining 12 this work is done by district nurses or officers of the public assistance committee taken over from the guardians. About 418 children are being maintained by 284 foster-parents. During the first nine months it was found necessary to remove six children from two foster-parents to places of safety.

Dr. S. N. Galbraith (S.W. Kent United Health Area) says that farms near Maidstone and Tonbridge made increased use of home-pickers of hops and that with cheap bus transport this development may increase. He says there were very few improvements undertaken in the camps and that the week-end visitors remain a great problem. The transmission of infection by hoppers remains a problem. One family of eight, all suffering from small-pox, travelled down last year by ordinary train. The medical care of the hoppers is mostly carried out by voluntary organisations, and a scheme has been devised for linking these organisations in a coördinated plan and for dividing the large hop-picking area into sub-districts. Dr. Greenwood discusses the housing returns from the districts. The closing orders were fewer and the houses demolished more than in the previous year. The shortage of houses is estimated to be considerably greater than in 1929.

A conference of the medical officers of health and sanitary inspectors of the districts was held at Maidstone in March, to discuss the possibility of aiding employment by water-supply schemes, and as a result schemes are proposed in various districts.

Durham.

Dr. C. Franks in his first report says that many of the vital statistics are the most satisfactory on record.

Medical Diary

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

Monday, Jan. 25th.—8 P.M., Odontology. Casual communication: Mr. J. Edgley Curnock: Osteomyelitis of Jaw—Spontaneous Fracture. Paper: Mr. E. C. Sprawson: Preliminary Investigation of the Influence of Raw Milk on Teeth and Lymphoid Tissue.

Wednesday.—5 P.M., Comparative Medicine. Discussion: *B. welchii* Infections in Animals and Man. Opener: Major T. Dalling, followed by Mr. A. D. McEwan, Dr. Muriel Robertson, Mr. B. W. Williams, Prof. C. C. Okell, and others.

Thursday.—8.30 P.M., Urology. Mr. Ralph Thompson: The Treatment of Urinary Calculus. (Presidential address.)

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W.

Monday, Jan. 25th.—8.30 P.M., Discussion on the Causation and Treatment of Essential Hypertension, to be introduced by Dr. Geoffrey Evans and Dr. G. Arbour Stephens.

MEDICO-LEGAL SOCIETY.

Thursday, Jan. 28th.—8.30 P.M. (11, Chandos-street, Cavendish-square, W.), Dr. L. A. Weatherly: The Liberty of the Subject from the Medico-legal Aspect. To be followed by a discussion.

MEDICAL SOCIETY FOR THE STUDY OF VENEREAL DISEASES, 11, Chandos-street, Cavendish-square, W.

Friday, Jan. 29th.—8.30 P.M., Mr. David Lees: Paper on Observations on Syphilis of the Nervous System and its Treatment. A discussion will follow.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, W.C.

Monday, Jan. 25th, and following Wednesday and Friday.—5 P.M., Sir Arthur Keith: Malformations of the Human Body from a New Point of View.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

Monday, Jan. 25th, to Saturday, Jan. 30th.—Medical Society of London, 11, Chandos-street, Cavendish-square. Lectures on Endocrinology by Dr. W. Langdon Brown, at 8.30 P.M. Mon., The Parathyroids and Calcium Metabolism. Fri., The Adrenals and the Gonads. Lectures on Treatment, Wed., at 4 P.M., by Dr. B. T. Parsons-Smith on Heart Disease.—Metropolitan Hospital, Kingsland-road. Mon., Post-graduate demonstration of Ward Cases by Dr. P. Hamill at 2 P.M.—Royal Waterloo Hospital, Waterloo-road, S.E. Post-graduate demonstration by Mr. Lyle Cameron on Tues., at 2.30 P.M.—St. John's Hospital, Leicester-square, W.C. Post-graduate course in Dermatology. Clinics at 2 and 6 P.M. Lectures on Tues. and Thurs. at 5 P.M.—Further particulars from the Fellowship of Medicine.

WEST LONDON HOSPITAL POST-GRADUATE COLLEGE, Hammersmith, W.6.

Monday, Jan. 25th.—10 A.M., Genito-Urinary Operations, Gynæcological Wards. Skin Department. 11 A.M. Surgical Wards. 2 P.M., Surgical Wards, Medical, Surgical, Eye, and Gynæcological Out-patients.

Tuesday.—10 A.M., Medical Ward Demonstration. Operations. Dental Department. 11 A.M., Throat Operations; Surgical Ward Demonstration. 2 P.M., Operations, Medical, Surgical, Throat Out-patients.

Wednesday.—10 A.M., Children's Medical Out-patients. Medical Wards. 2 P.M., Gynæcological Operations. Medical, Surgical, and Eye Out-patients. 4.45 P.M., Venereal Diseases Demonstration.

Thursday.—10 A.M., Neurological Department. 11.30 A.M., Fracture Demonstration. 2 P.M., Operations, Medical, Surgical, Eye, and Genito-Urinary Out-patients.

Friday.—10 A.M., Medical Wards, Skin Department, Dental Department. 12 noon, Medical Lecture. 2 P.M., Operations, Medical, Surgical, and Throat Out-patients.

Saturday.—9 A.M., Throat Operations. 10 A.M., Medical Wards, Children's Medical Out-patients. Surgical Out-patients.

NATIONAL HOSPITAL, Queen-square, W.C.

Monday, Jan. 25th.—2 P.M., Dr. Riddoch: Out-patient Clinic. 3.30 P.M., Mr. Williamson Noble: Papillœdema.

Tuesday.—2 P.M., Dr. Walshe: Out-patient Clinic. 3.30 P.M., Mr. Armour: Chordotomy.

Wednesday.—2 P.M., Dr. Purdon Martin: Out-patient Clinic.

Thursday.—2 P.M., Dr. Kinnier Wilson: Out-patient Clinic. 3.30 P.M., Dr. Riddoch: Pathogenesis and Treatment of Headaches.

Friday.—2 P.M., Dr. Adie: Out-patient Clinic. 3.30 P.M., Mr. Elmquist: Demonstration of Re-educative Exercises.

UNIVERSITY COLLEGE HOSPITAL MEDICAL SCHOO University-street, W.C.

Tuesday, Jan. 26th.—5.15 P.M., Dr. R. A. O'Br Preparation Testing and Use of Antitoxin.

CHARING CROSS HOSPITAL MEDICAL SCHOOL

Sunday, Jan. 24th.—10.45 A.M., Mr. E. D. Davis: Diseas of the Ear. 11.45 A.M., Mr. A. O. Gray: Causes a Treatment of Sterility.

GUY'S HOSPITAL, London Bridge, S.E.

Monday, Jan. 25th.—5 P.M., Prof. J. M. W. Moris The Use of X Rays in Physiological Investigation

KING'S COLLEGE HOSPITAL MEDICAL SCHOO Denmark-hill, S.E.

Thursday, Jan. 28th.—9 P.M., Dr. G. F. Still: Epilepsy Children.

ROYAL NORTHERN HOSPITAL, Holloway-road, N.

Tuesday, Jan. 26th.—3.15 P.M., Mr. N. A. Jory: Extrac

ST. MARK'S HOSPITAL, City-road, E.C.

Thursday, Jan. 28th.—4.30 P.M., Dr. Cuthbert Duke Pathology of Fistula and Fissure.

HAMPSTEAD GENERAL AND NORTH-WEST LONDO HOSPITAL.

Wednesday, Jan. 27th.—4 P.M., Dr. J. Alison Glove Tonsillitis.

CITY OF LONDON MATERNITY HOSPITAL, City-ro E.C.

Thursday, Jan. 28th.—5.30 P.M., Mr. A. L. Walke Treatment of Contracted Pelvis.

LONDON SCHOOL OF DERMATOLOGY, St. John's Hospit 49, Leicester-square, W.C.

Tuesday, Jan. 26th.—5 P.M., Dr. A. M. H. Gray: T Sarcoids.

Thursday.—5 P.M., Dr. M. Sydney Thomson: Lich Planus.

HOSPITAL FOR EPILEPSY AND PARALYSIS, Mai Vale, W.

Thursday, Jan. 28th.—3 P.M., Dr. E. Blake Pritchar Clinical Varieties of Muscular Weakness. (Clini meeting for Medical Practitioners.)

CENTRAL LONDON THROAT, NOSE, AND EAR HO PITAL, Gray's Inn-road, W.C.

Friday, Jan. 29th.—4 P.M., Mr. F. W. Watkyn-Thom Fractures of the Skull and Otology.

ST. PETER'S HOSPITAL, Henrietta-street, W.C.

Wednesday, Jan. 27th.—3 P.M., Dr. J. Roth: Mod Uro-radiological Investigation.

ROYAL INSTITUTE OF PUBLIC HEALTH, 37, Rus square, W.C.

Wednesday, Jan. 27th.—4 P.M., Dr. R. Fortescue F The Rise of the Conception of Rheumatism as a So Problem.

SOUTH-WEST LONDON POST-GRADUATE ASSOC TION, St. James' Hospital, Ouseley-road, Balham.

Wednesday, Jan. 27th.—4 P.M., Dr. C. E. Lakin: Dem stration of Medical Cases.

ST. MARY'S HOSPITALS, Manchester.

Friday, Jan. 29th.—4.15 P.M. (at the Whitworth-st West Hospital), Dr. Fletcher Shaw and Dr. J. Bride: Antenatal Demonstrations.

EYE INFIRMARY, Glasgow.

Wednesday, Jan. 27th.—4.15 P.M., Mr. A. B. J. Pollock Dr. H. S. Martyn: Eye Cases.

FACULTY HALL, St. Vincent-street, Glasgow.

Tuesday, Jan. 26th.—4 P.M., Dr. D. K. Henders Modern Trends in Psychiatric Practice.

Births, Marriages, and Death

BIRTHS.

Charters.—On Dec. 16th, at Tunbridge Wells, the wif A. D. Charters, M.B. Camb., D.T.M. & H. Eng., of a

Good.—On Jan. 13th, at a nursing home, Horsforth, the wi Dr. John Good, Stonegate-avenue, Meanwood, Leeds a son.

Marsh.—On Jan. 5th, at Devonshire-street, W., the wif L. Russell Marsh, L.D.S. Eng., of a son.

Weiner.—On Jan. 16th, at "Macfil," Clapgate-lane, Ipsw the wife of Philip Weiner, M.R.C.S., L.R.C.P., of a so

MARRIAGES.

King—O'Leary.—On Jan. 14th, at St. James's Church, Spa place, W.1, Reginald Alfred King, M.B., B.S Lo F.R.C.S. Eng., to Mary O'Leary, M.R.C.S., L.R.C D.P.H., daughter of Mrs. J. O'Leary and the late M O'Leary, of Mologhroe, Co. Cork.

DEATHS.

Calvert.—On Jan. 13th, suddenly, James Calvert, C.B.E., M F.R.C.P., Consulting Physician to St. Bartholom Hospital, of Harley-street, and Portman-mansions, aged 76.

Coleman.—On Jan. 13th, at Corn [illegible] James George Blyth Coleman, [illegible]

Greenwood.—On Jan. 13th, at hi [illegible] road, Dulwich, from heart [illegible] L.D.S. R.C.S. Eng.

Magoris.—On Jan. 14th, at Great Shelford, William O Magoris, M.R.C.S., L.R.C.P., aged 71.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notic Births, Marriages, and Deaths.

NOTES, COMMENTS, AND ABSTRACTS

POST-VACCINAL ENCEPHALITIS:

TS ASSOCIATION WITH VACCINATION AND WITH POST-INFECTIOUS AND ACUTE DISSEMINATED ENCEPHALITIS.*

BY PROF. RICARDO JORGE,
ESIDENT OF THE PUBLIC HEALTH COUNCIL OF PORTUGAL.

Principal Characteristics.

ost-vaccinal encephalitis appears to be an infection cent date. Its beginning, or rather our knowledge t, dates from the year 1922. The earliest cases discovered in England then, and independently Holland in 1924. Other and older cases were hwith recalled as, on a retrospective diagnosis, ing been certain or at least probable examples he same condition—for example, that of Turnbull, g back to 1912, while others still earlier were llected by doctors in Switzerland, Germany, and where. These "retrospective" cases do not, ever, go further back than the closing years of past century.

t has not been possible to find any clear indica- is of complications of an encephalopathic nature owing vaccination during the long series of years ch succeeded Jenner's discovery. Gins (personal munication) has come across a vague mention nervous complications in the works of an early cinator, Sacco. Kaiser has recently cited an ial report in Bohemia in 1801, which alludes to vous reactions following Jennerian vaccination.[1] past times certain special commissions for the study he dangers of vaccination were in session in England considerable periods; and a most persevering minute inquiry of this kind was made on complica- is observed after vaccination without the discovery cerebral involvement (Royal Commission on cination 1889–1896). A similar inquiry in Holland 1902, to which 90 per cent. of the doctors in the ntry contributed, reported as nervous complica- is following vaccination only two cases which e tuberculous meningitis (Jitta).[2] It is, of rse, quite possible that one or two isolated cases y have escaped detection, but it seems unlikely t epidemic waves, such as those which have urred in England and Holland, could have passed recognised.

Until wider information is at our disposal we must clude that encephalitis as seen at the present day not been contemporaneous with the practice vaccination, which has been world-wide for nearly years without revealing attacks on the nervous tres of those vaccinated. Hence, both on presump- n and in practice, here is a new disease and one recent date.

DISTRIBUTION.

Post-vaccinal encephalitis has a very irregular geo- aphical distribution (vide previous report of 1930).[3] ny countries have not been affected; in them, spite of careful inquiry, not a single case has been served. The countries which have suffered the st, but now to much less extent than in previous ars, are England and Holland, while Austria, rmany, Norway, Sweden, and the United States ve supplied an appreciable number of cases. Then llow countries with rare sporadic cases, and, finally hers, where all that can be said is that the statistics the malady are merely represented by a zero.

How are these topographical differences to be explained—maximum incidences in one place and no incidence in another? The difference in the age selected for vaccination helps to explain the inequality of distribution; encephalitis will be found where the primary vaccinations are, as a rule, performed at school age—the period which is most susceptible as regards encephalitic invasion.[3]

Even in England and Holland, however, the chorographic distribution of cases is most irregular, and one can only surmise from this that here is one more example of what is usual for other epidemic infections. Even in countries which have suffered most from it, the disease is rare and the attack rate forms an infinitely small percentage, whether in relation to the general population or to the number of persons vaccinated.

NEUROLOGICAL MANIFESTATIONS.

Post-vaccinal encephalitis has its own neurological characteristics but at times assumes polymorphous forms. These morbid characteristics continue to be manifest and, especially in the English series, the majority of cases diagnosed as post-vaccinal encephalitis are still in their clinical aspect identical with the cases originally described. The condition is fundamentally monotypical, repeating itself in case after case. Its evolution is that of an acute disease which, in cases of recovery, is quickly over without leaving any complication. Sequelæ are relatively rare by contrast with encephalitis lethargica and with other varieties of meningitis and encephalitis.

When one looks at these happenings as a whole, it appears that there have been more exceptions to this general homogenicity of symptoms recently; in other words, that the clinical manifestations and the nature of the syndrome have become more variable. If post-vaccinal encephalitis was originally monotypical it has escaped from its exact boundaries and is showing definite tendencies to variation. One may, therefore, have to add to the original picture localised paralyses, hemiplegias, convulsions, polyneuritis, &c., and these complications at times introduce serious difficulties in the diagnosis and the clinical typing of the disease. However this may be, it is not enough merely to attach this label whenever nervous complications appear in a vaccinated case. The data obtained should undergo careful sorting with a view to eliminating infections which are associated with a known or likely cause, such as syphilis, cerebro-spinal meningitis, tuberculous meningitis, purulent meningitis, encephalitis lethargica, poliomyelitis, &c. Grey and Whittaker[4] have reported two cases of staphylococcal septicæmia in which post-vaccinal encephalitis had been diagnosed from which, following the Rolleston Commission, they concluded that the bacteriological investigations necessary to exclude septicæmia are never to be forgotten in the examination of these cases. Priest[5] reports a similar case which one would have looked upon as post-vaccinal encephalitis if a blood culture had not revealed the presence of *Staphylococcus albus*. Certain cases occurring in Holland thought to be post-vaccinal encephalitis have been found on autopsy to be due to some entirely different condition (communication from Mr. Jitta). And even when all these exclusions have been made there still remain some cases which are indefinite or doubtful owing to the absence of sufficient signs or other reasons.

Gins[6] would like to see a most rigorous distinction established—the diagnosis of encephalitis to be reserved for cases in which cerebral inflammation has been established histologically, or for those which are followed by sequelæ indicative of encephalitis. All other conditions should be called *nervous complications*. Since autopsies are rare and sequelæ infrequent, the resulting total of proved cases of encephalitis would, on this basis, be decidedly meagre. In our and revaccinated adults, and alsol of patients suffering from nervous troubles after inocuation. Out of 188 samples of blood taken during the course of a normal vaccination, they have verified in 47 instances the presence of the virus from the third to the tenth day. In one vaccinated case the virus persisted until the seventeenth day; it was absent in the revaccinated. The results were negative as regards the mucous excretion of the tonsillar region, which leads one to think that the elimination of vaccine by the throat is not as frequent as Gins believed it to be.

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* Translation of the substance of a report to the Commission Small-pox and Vaccination of the Office International Hygiène publique by Prof. Ricardo Jorge (Delegate for rtugal), President of the Committee. This report, which s prepared e rapporteur on the subject ir George r Great Britain), was sub- itted to the of the Office International Hygiène publique at its session of October, 1931, and appears the Bulletin mensuel de l'Office International, December, 1931.

It is remarkable that it was never possible to demonstrate the presence of the vaccine virus in 56 samples of cerebro-spinal fluid collected from vaccinated subjects free from complications. But the virus was obtained in two out of five cases with nervous complications, and was also found in the tonsillar region. Hence the deduction that the affection of the nervous centres might be due to an invasion of the cerebro-spinal fluid which has failed in its *function as a barrier to myeloencephalitis.* The facts are not yet sufficient to place this proposition on a firm basis. Moreover, in vaccinated animals the brain harbours the virus, and it can be found in rabbits in the cerebro-spinal fluid even when the vaccinal condition progresses in the normal way. Gins[21] detected the persistence of the virus in the blood and spinal fluid of two human cases on the twenty-fifth and twenty-sixth day. One of these vaccinated persons was suffering from tuberculous meningitis and the other from cerebral syphilis, and the author considers that this departure from the normal might be explained by the delay which these morbid conditions would cause in the elimination of the virus. This question can only be thoroughly examined in the light of further research on the production of encephalitis by the vaccine virus in animals.

EXPERIMENTAL ENCEPHALITIS OF VACCINAL ORIGIN.

Susceptible animals submitted to cutaneous inoculation do not show cerebral complications during or after the evolution of the vaccinal process. Their position is the same as that in the human subject before post-vaccinal encephalitis was known. Observation and experiment have never shown encephalitis in the most susceptible, such as the calf, which provides the lymph of the institutes, or the rabbit which is the laboratory touchstone of vaccinia.

Such exceptions as can be gleaned from literature confirm by their extreme rarity this rule of brain tissue being unaffected by vaccination. We have only found the two following. Van Bouwdijk Bastiaanse,[22] in examining a calf killed 11 days after inoculation, found lesions in the brain similar to those of post-vaccinal encephalitis in man. This single and isolated case is not very convincing. Flexner[23] reports, from a personal communication from C. Rhoads, that two rabbits inoculated with a neurotesticular vaccine which produced severe cutaneous lesions died with marked nervous symptoms—a meningo-encephalitis, confirmed post mortem—whereas the other organs were apparently not much affected.

Normally, and as a general rule, there is no such thing as internal vaccinal metastasis; the brain, like other viscera, remains indifferent to the virus which bathes it. For these organs to be affected there must be direct inoculation of the lymph, and even then the brain often resists the injection. As a successive passages through the brain necessary for the cultivation in its accine of Levaditi. The roduced has characters mation, accompanied f irritation. Do the the histological stamp Kinnershoff, Pondman, and rabbits and monkeys, ammations, the lesions those which appear in the lren following vaccination. Lymphs which have been the cause of litis do not even possess any marked neurotropis several of them were of quite a low virulence and no action on the brains of rabbits. Weston and Fairbrother,[25] following research carried out rabbits in which they produced encephalitis by dire cerebral inoculation, conclude that human and animal encephalitis show altogether different logical characteristics. It has never been to provoke encephalitis by cutaneous inoculation, even after submitting the nervous system to slight trauma. These authors deny that there is a encephalitogenic, or even a neurotropic, property in vaccine virus.

Whatever may be the reasons, this resistance of the brain to vaccinal phlegmasia is an established fact. Ledingham and Barratt, by injecting large doses of neurotesticular vaccine into the veins of rabbits, have produced local and visceral reactions; but the brain remained unaffected.

Such then was the knowledge obtained by observation and experiment until the recent work of Eckstein which opened a new horizon to experiment and pathology. Eckstein turned his attention not to rabbits, the ritual animals, but to monkeys. These had already been employed by other investigators but instead of using the usual channels of inoculation the failure of which to produce encephalitis was notorious, Eckstein adopted the intrathecal route In this way, he claims to have succeeded in producin a disseminated meningo-myeloencephalitis clinicall and histologically identical with human post-vaccin encephalitis. There was no failure, since of 1 monkeys injected with several varieties of lymp all fell ill, even after very small doses, whilst of thr animals injected with massive doses of lymph in the arteries none presented similar signs.

These results require to be confirmed, the more as they are in opposition to the present histologic evidence according to which the vaccine vir inoculated directly into the brain produces lesio which differ from those of post-vaccinal encephalit Can any inferences applicable to the human ca be drawn from these experiments. Have th resulted from the invasion of the cerebro-spi fluid by the virus? If so, it should be proved from sufficient series of cases systematically examined t in normal vaccination the virus is not detectable the cerebro-spinal fluid, but that it is to be fou in the vaccinations followed by bad results. (would then arrive at the following pathoge mechanism: the invasion of the brain is promo by the vaccine which, surmounting the vasc barrier, invades the fluid medium which surrou and protects the nervous centres. Why and how function of these protective barriers is deranged wo still remain to be explained.

Conclusions of Part I.

What has been said above shows that there weighty reasons to inculpate vaccinia itself as author of the encephalitic process; these reas nevertheless are not sufficiently strong to be gener convincing. It is repugnant to believe that operation whose innocence in this respect has shown by 100 years of world-wide experience, which every year continues to be performed by million without any ill-effect, should be capabl such wrong-doing. How, it is asked, can one impli the lymph which, in its country of origin, has n produced nervous troubles, but which, transpo to another country in which encephalitis exists, been followed by accidents? For instance, the vac imported from Denmark, where no case had observed, caused in Holland as much enceph as the native strains (Peter Holst[27]).

This extreme rarity and the caprices of incid make the idea of attributing the causation of encephalitis to the lymph repellent. Others turned to the invocation of dysergies of the virus have called in aid factors which bring the inf process into play—hyperergia; allergia; parallel

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Out-patien

NATIONAL HOSPITAL,

MONDAY, Jan. 25th.—2 P.M.,
Clinic. 3.30 P.M., Mr. Willian
TUESDAY.—2 P.M., Dr. Wals
3.30 P.M., Mr. Armour : Chor
WEDNESDAY.—2 P.M., Dr. Purd
Clinic.
THURSDAY.—2 P.M., Dr. Kin
Clinic. 3.30 P.M., Dr. Ri
Treatment of Headaches.
FRIDAY.—2 P.M., Dr. Adie : Out
Mr. Elmquist : Demons
Exercises.

sion of antibodies; anaphylactic shock and
ctic failure—but without coming nearer the
ion of the problem. Nor have we advanced it
nvoking mutation of the virus, or individual
sive power.

e are certain that a virus is concerned. If
nal virus is not guilty, where is the other to be
l ?' This virus x remains unknown. It would be
which would engender the encephalitis in bivalent
biosis with the vaccinal. The vaccinal does no
than cause the occult virus to spring into patho-
activity, in the same way as the priming causes
explosion of the powder. A mysterious virus,
g and moving in a complete physiological silence,
revealing its morbigenic force when in catalytic
act with cow-pox.

check to this hypothesis, probable or not in pure
ry, was the absence of other forms of encephalitis
parable to the vaccinal. It was difficult to
rstand how a really encephalitogenic virus
l have no effect by itself and could only exert
nfluence when aided by vaccinia. This objection
recently been removed by the study of post-
tious encephalitis and acute spontaneous dis-
nated encephalitis. Here, then, is a further
ct of the problem to be considered and another
to its solution.

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(*To be concluded.*)

A USEFUL CATALOGUE.

WE have received from Messrs. Mayer and Phelps
ir new catalogue of surgical instruments and
pliances. These are mostly made in a factory
hind the premises in New Cavendish-street, so that,
th few exceptions, all the articles in the catalogue
of British manufacture. The productions of the
m practically cover every medical or surgical
ergency, and it is noticeable in the catalogue that
great many of the instruments have been made, or
being made, according to particular specifications
m well-known practitioners. The catalogue is
efaced by some interesting and practical notes upon
value and limitation of stainless steel for surgical
struments.

NEW PREPARATIONS.

EPHEDROL (Messrs. Clay and Abraham, Ltd., Liverpool).—This preparation of ephedrine, the formula for which is: ephedrine 1·0, camphor 2·0, aromatic oil q.s., neutral oil add 100, is supplied in a bottle with a rounded nozzle from which the fluid is inhaled or sniffed. The physiological effects of ephedrine are similar to those of adrenalin, but the action is more prolonged. It enjoys good repute in the treatment of asthma, for the remedy of which it is said to have been employed for 1000 years in China, its home country. When applied to the congested nasal mucous membrane ephedrine reduces turgescence without causing local irritation.

UROSELECTAN B.—Messrs. Schering, Ltd., 3, Lloyd's-avenue, London, E.C., have sent us a sample of the preparation termed Uroselectan B, which is now frequently employed as a contrast agent for the radiographic visualisation of the kidneys and urethral tract by intravenous injection. Chemically it is a di-sodium salt of 3·5 di-iodo-4-pridoxyl-N-methyl-2·6-dicarboxylic acid and is supplied in ampoules of 20 c.cm. solution ready for use. At a meeting of the section of urology of the Royal Society of Medicine, held in March, 1931 (vide THE LANCET, April 4th, 1931, p. 757), Prof. A. von Lichtenberg, of Berlin, delivered an address on excretion urography, in which he reported upon the results obtained in the employment of several new intravenous contrast substances, and spoke of the decided advantages obtained through uroselectan B.

MERCOLLOID.—We have received from Messrs. Coates and Cooper, Ltd., 94, Clerkenwell-road, London, as agents for The Bio-Chemical Laboratories, Ltd., Locarno, Switzerland, samples of Mercolloid, a preparation of colloidal mercury sulphide for which a special spirochætal value is claimed; in the view of the manufacturers the drug is indicated in syphilitic and parasyphilitic affections of every kind. Its value in psoriasis is also stressed. The preparation is a colloidal mercury sulphide in finely dispersed pure suspension, made up in ampoules of 2 c.cm., each ampoule containing 0·010 g. colloidal mercury sulphide. Intramuscular injections are made daily, or at other time intervals as directed by the practitioner.

PERCAINE CIBA (Clayton Aniline Co., Ltd., 40, Southwark-street, London, S.E.).—A sample of this preparation, a 2 per cent. isotonic solution of percaine "ciba," is supplied in a 30 c.cm. bottle. Percaine, as we said in these columns on its introduction as a new local anæsthetic, should be a valuable adjunct to the agents available for producing local analgesia, and during the two years that have elapsed we have heard no reports of ill-effects from its employment. The solution of the strength now supplied has been specially introduced for surface anæsthesia of mucous membranes in oto-rhino-laryngological work, and may be applied by dabbing, painting, or as a spray. A recent article in the *British Medical Journal* (Nov. 28th, 1931, p. 986) by Mr. M. C. G. Israel, M.Sc., and Dr. A. D. Macdonald has confirmed the claims of the manufacturers that the solutions can be sterilised by heat without loss of strength; they find that sterile solutions are stable and retain full activity for at least several months. The minimal effective concentration of percaine for producing surface anæsthesia in the human subject was found to be about 1/40 of that of novocain. The preparation is intended for external use only by application to the mucous membrane.

INSTITUTIONAL TREATMENT OF ALCOHOLISM.

THE superintendent of the Bay Mount Home at Paignton classifies his cases for 1930 into three groups: patients who have become chronic alcoholics for no obvious psychological reason, but as a result of constantly drinking with friends and business associates; alcoholics who drink for some definite psychological reason (e.g., to relieve a phobia); and the true dypsomaniacs, who develop a periodical craving for alcohol which continues until the patient is saturated and then stops abruptly. The first class of case can be cured for certain in an institution if the patient wishes. Most of the cases in class II. are also curable, but need psychotherapy besides medicinal treatment. During the year the Bay Mount Home received 18 cases in class I., 12 cases in class II., and 2 cases in class III.; also 5 drug cases, 2 cases of obsessional neurosis, 2 of exhaustion neurosis, 3 of neurasthenia, and one ill-defined case of insomnia. The medical superintendent declares that every year that passes strengthens his opinion that almost any case of inebriety can be cured if the patient can and will give the time and make the effort necessary. Patients who have been treated successfully often return periodically for ten days or so to have tonic treatment, and this habit has proved very valuable to them.

STERILITY OF HANDS IN MIDWIFERY.

In the course of a paper read before the Edinburgh Obstetrical Society on Dec. 9th, Dr. Lachlan Grant reviewed the possible sources of infection in childbirth. In deliveries conducted in the home, he said, several basins, enamel or porcelain, are usually employed. These may be boiled, scrubbed out, or flamed with spirit. Thereafter, an unmeasured quantity of disinfectant is poured into an unmeasured quantity of water and the lotion is supposed to be ready for immediate use. The interior of the receptacles is rendered slightly more sterile by this means, but the difficulty is that the basins are very liable to contamination *anew* owing to the cleansing, swabbing, and rinsing. The completely sterile basin can only be produced by constantly subjecting it to steam heat or by keeping it in contact with a suitable chemical solution for adequate periods. If microbes are deposited in freshly prepared solutions of, for instance, perchloride or biniodide of mercury 1/1000, five to ten minutes must elapse before the solution is rendered sterile and quite safe for further use.

One of the most effective methods to adopt, both in the home and in institutions, is to employ some form of elevated water flushing apparatus. What is required is the same type of faucet as that used in operating theatres, so that contact with the unclean sides of the basin walls is avoided. The portable spray which Dr. Grant described consists of separate rubber joint attachments to both hot and cold lavatory-basin or bath-tap inlets. These are fixed by a screw and rubber join. The junction of the hot and cold rubber tubes is not far from the spray nozzle, and the combined spray is supported on a pedestal; by means of a non-return valve in the hot-water tube the temperature of the flowing spray is easily regulated. Where tap unions are found unsuitable, or where a portable spray is not at hand, it is necessary to find an appropriate substitute. The following apparatus, in Dr. Grant's opinion, is simple, safe, and efficient. A large irrigating jar or reservoir is elevated some six feet, supported on a stand or shelf. It has a draw-off tap at its lower end, and is fitted with a rubber tube to which is attached a small neat strong glass or nickel spray or jet. The spray is supported centrally over a wide-mouthed basin or bath some 20 in. in diameter and placed on a stool or chair at a height to avoid splashing. This bath receives the soiled fluids falling from the washed gloved skin or instrumental surfaces, and there is no possible reapplication of bacteria. Antiseptic solutions can be used, and the flow is available alongside the patient's bed—a great advantage. An electric portable immersion heater can at times be used to keep the temperature right. For large institutions it would be possible to have fixed electric heating unit reservoirs on trolleys which could be wheeled to any bedside.

Instead of an elaborate make of reservoir with a lift-up lid and special draw-off tube, Dr. Grant suggested that a simple syphon-action arrangement could be used in the homes of patients. The Rotunda douche is exceptionally suitable, the usual glass vaginal douche being withdrawn and a small glass spray taking its place. The jug or ewer reservoir is raised and fixed and the basin to hold the used solution is placed on a stool or chair. The spray hangs centrally over this basin. By means of two jugs or reservoirs, two Rotunda douches, and a glass Y-piece, with the spray nozzle attached to its lower end, one can make use of either sterile water or lotion as required. The same applies to the larger makes of reservoirs for hospital use. Dr. Grant urged that the washing, rewashing, and dipping of hands after contamination in a stationary aseptic or antiseptic solution in a basin is not to be compared with the action of the downward spray cleansing. Spray in larger reservoirs can be operated by a foot pedal. At present the flow is started and stopped by hand. To overcome the difficulty of the cleansed hand surfaces coming in contact with the spring clip or handle of the tap, he has prepared small sheets of sterilised paper encased in sterilised envelopes. Larger sheets of sterilised paper may be used for laying out instruments.

Appointments

Crisp, T., M.D., Ch.B. Edin., Medical Referee under the Workmen's Compensation Act for Chorley, Lancaster and Preston County Courts.

Edwards, Sybil O., M.B., Ch.B. Lond., D.P.H., Asst. M.O.H., Lowestoft and M.O. of Schools.

Howell, Nancy G., L.R.C.P. Lond., M.R.C.S., Asst. M.O.H., Acton.

Vacancies

For further information refer to the advertisement columns.

Bangor, —Jun. H.S. £10

Birming Asst. M.O. and

Der

Birming £400.

Birmingham and Midland Eye Hospital.—Res. Surg. O. £15

Bradford Royal Infirmary.—Two H.S.'s. Each at rate of £13

Brighton, Royal Sussex County Hospital.—H.S. £150.

Bristol Royal Infirmary.—H.P.'s and H.S.'s to Special Depts. Each at rate of £60. Also Cas. H.S. At rate of £100.

British Guiana.—Two Asst. Govt. M.O.'s. £650.

City of London Hospital for Diseases of the Heart and Lungs, Victoria Park, E.—H.P. At rate of £100.

Doncaster Royal Infirmary.—H.P. and H.S. for Cas. Dept. Each at rate of £175.

Durl £150.

Glas logist. £800.

Glas ectureship in Mater

Grav H.S. £100-£150.

Grin 00.

Har

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Hospital for Sick Children, Great Ormond-st., W.C.—Cas. O. £

Hostel of St. Luke, 14, Fitzroy-sq., W.—Res. M.O. At rate of £2

L.C.C.—Sen. Asst. M.O.'s for Hospital Service. Each £5

Leicester, City Mental Hospital, Humberstone.—Second Ass Res. M.O. £400.

Liverpool, Alder Hey Children's Hospital, West Derby.—Re Asst. M.O. £200.

Liverpool Eye and Ear Infirmary.—Ophth. H.S. £120.

Liverpool, St. Paul's Eye Hospital.—Hon. Asst. Surg.

Liverpool University.—Lecturer in Radiology.

ed. 1st Asst. and Reg. £300.

Tuber. O. £650.

Hospital.—Asst. M.O. £300.

ospital for Sick Children.—Hon. As

hys. and Hon. Asst. Surg.

Queen Mary's Hospital for the East End, E.—Hon. Asst. Surge and Physician.

St. Thomas's Hospital.—Phys. to Out-patients.

Sheffield Royal Infirmary.—Ophth. H.S. At rate of £80.

Western Ophthalmic Hospital, Marylebone-road, N.W.—S Res. H.S. At rate of £150.

Wes *W.*—Non.-Res. Cas

Asst. Anæsthetist.

Wor M.O. £120.

Yorl ye, Nose, and Thr Dept. £150.

The Chief Inspector of Factories announces vacant appointme for Certifying Factory Surgeons at Swinton (Lancs.), Rh (Aberdeen), Llannelhaiarn (Caern), and Guisborough (Yor N.R.).

The Home Secretary gives notice of a vacancy for a Medi Referee under the Workmen's Compensation Act, for t Districts of the Dewsbury and Leeds County Cou (Circuit No. 14). Applications should reach the Priv Secretary, Home Office, Whitehall, London, not later th Feb. 6th.

ADDRESSES AND ORIGINAL ARTICLES

THE ÆTIOLOGY OF CARCINOMA.*

J. J. M. SHAW, *M.C.*, M.D., F.R.C.S., F.R.S. EDIN.,
ISTANT SURGEON TO THE ROYAL INFIRMARY, EDINBURGH; LECTURER IN SURGERY AND ASSISTANT TO THE PROFESSOR OF SURGERY IN THE UNIVERSITY OF EDINBURGH.

THE field of cancer investigation is wide; the workers therein are many and of great diversity in training and outlook. The extent and many-ledness of the problem render its presentation a matter of considerable difficulty. This difficulty lies mainly in the comprehension and proper coördination of the vast amount of relevant information which is available and not, as is sometimes suggested, in the vastness of our ignorance of the nature of the process. Whichever view be held, it is advisable for each of us to formulate the question from time to time, "What do I understand by the term Cancer?" and to attempt to coördinate our ideas so that we may assess the value of new observations in the chain of causative factors. An effort in this direction is preferable to the attitude of awaiting the discovery from some source, as yet undiscerned, of a single and intimate ause of cancer, because it has become almost certain hat no such single proximate cause exists.

In traversing the wide range of fact and opinion which demand consideration, there is a choice of two methods. Either a narration may be given of a long series of observations, experiments, and theories, or an attempt may be made to weave these into some measure of sequence so that the gaps in our knowledge may be emphasised. At a time when cancer investigation has lately suffered the loss of Archibald Leitch, it may not be considered too presumptuous if an attempt is made, by choosing the second method, to follow his precept to place our facts in order.[1] I hope it may thus be possible to provide a thread on which the more important observations may be linked together and, in this form, be more easily understood and remembered.

Growth and Independence of the Cell.

We will regard carcinoma as the process of growth in cells which have either failed congenitally to come under those influences which determine cell function and form, or which, after being subject to such differentiating influences, have become independent of them owing, apparently, to a prolonged change in environment.

A definition of cancer as a disease would demand a different statement in which the tendency towards fatality in the host and the apparent anarchism of the carcinomatous cell group assume prominence. In a consideration of ætiology, however, it is desirable to put aside this "malignant" aspect of the question—i.e., the effect upon the host— and to postulate an essential "naturalness" in the process as a physiological response to the influences which act upon the cell. The possibility of lawlessness or vagarious action on the part of a living cell would at once render a discussion of causation entirely sterile. The ideas of "unnaturalness" and "lawlessness" have drifted into the study of the cancer problem by strained analogies with the conduct of beings endowed with the power of thought.

The neoplastic process is founded upon the potentiality for independence of all the cellular entities which, in their aggregation and sufficient coördination, give us a composite living body. The cell is primarily an individual and secondarily a citizen. The tissue culture slide, the persistence of cell life for several days after somatic death, the free grafting of tissues, the vitality of the spermatozoon, and the self-sufficiency of the ovum—all these proclaim a capacity for survival of cells in the disjoined state, either when specially prepared for separation as are the reproductive cells or when artificially separated as in the other instances. The capacity for growth in the living cell should not be regarded as a specialised function or as an alternative to other specialisations. The view of M. T. Burrows, that the cell may swing now to growth and now to other function according to the presence of a growth stimulant (archusia) in excess, or a work stimulant (ergusia), cannot be fully maintained. Cramer expresses the position clearly when he says:

> "The similarity between the process of growth and other manifestations of cell life suggests that growth should be looked upon simply as a property inherent in living protoplasm in the same sense as metabolism, contractility and irritability. This is by no means a new conception. It is emphasised again because the conclusions drawn by many recent workers on the growth problem frequently suggest or imply that growth is a property which can be added to or taken away from living protoplasm. Such expressions as cells 'losing' or 'acquiring' the power of growth suggest that cells contain or possess something which is absent from cells which are said to have 'ceased to grow,' and a similar conception is implied in the term 'growth-substance.'"[2]

Warburg expresses it thus: "The resting condition of adult tissue is only apparent; in reality it is a condition of equilibrium in which growth and decay counterbalance one another."[3] In Nicholson's words: "Excessive growth and therefore tumour formation is one of the physiological potencies of every healthy cell."[4]

DIFFERENTIATION.

We are prone to regard a specialisation of function and a corresponding differentiation of structural form as the natural condition of the cell, especially the epithelial one. Should these not rather be regarded as an imposition upon the individual for the communal welfare, entailing a sacrifice of its natural proclivity towards free growth and reproduction which are its essential properties? The living cell is a plastic and versatile entity which is capable of rapid reversion towards its true primitive form, as shown when the leash of control is removed in the urgencies of repair.

Differentiation is not manifest in the earliest stages of the developing embryo. It may disappear temporarily during the processes of repair. May it disappear finally if factors resembling those responsible for the proliferations of repair are allowed to act over a prolonged period of time so that an inveterate habit is established? Ewing states that inflammatory hyperplastic processes pass by insensible gradation into neoplastic growth according to our present analysis.[5]

The group of cells which is irresponsive to the differentiating influences is not extruded from the body. In their capacity for acquiring sustenance they may alter the metabolism of the host. As Carter Wood remarks: "The fact that cancer cells are a real independent life inside the body, just as much as the fœtus is, and perfectly adapted to the soil in which they grow, does not seem to be fully recognised."[6] Such a growth induces changes in the blood and other tissues of the host, and one of the chief difficulties in our present state of knowledge is to decide how far these manifestations are causal in nature and how far they are secondary or incidental. In a consideration of ætiology we must be careful that changes such as those observed in the blood which result from the presence of the independent growth are not described as factors which cause that independence until their exact interpretation is determined. A study of the blood and excretory changes in pregnancy yields valuable information and provides useful tests, but deductions in regard to fœtal origin have not been made from them. With full recognition of the value of their work, I shall refrain from discussing the observations of such workers as Shaw Mackenzie, Bendien, Haddow, Maisin, Pacetto, and many others who have studied the serological reactions, &c., in cases of established cancer.

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* A post-graduate lecture delivered at Edinburgh.

Three Ways in which Carcinoma is Produced.

It has been indicated that the state of non-differentiation may be shown either by cells which have never reached maturity of structural form or by the descendants of cells which have been differentiated but which have been altered by some means so that differentiation has been modified or has disappeared. A recognition of this distinction is important and serves to prevent the stultification of discussion which occurs when the expositor of an extrinsic cause is assailed with the question, "What can your extrinsic cause have to do with, say, the renal blastoma of the infant?"

We may succeed in rendering the question less difficult if we describe three different methods of production of carcinoma, a grouping which has the additional advantage of bringing the various branches of experimental work into perspective with the human manifestations :—

(1) *Implantation*, in which a growing carcinoma is transferred from one host to another and continues to grow without apparent modification.

(2) *Continuing*, in which an embryonic cell group fails to come under the influence of the mechanism of differentiation and continues to grow in its natural primitive state and to reproduce in the manner of undifferentiated multicellular organisms. In this group the outstanding example is the renal blastoma or embryoma, which, often, cannot be accurately classified as carcinoma or sarcoma because the stage of differentiation into germinal layers has not been attained.

(3) *Conversion*, in which a single differentiated cell or cell group becomes altered under some change in environment so that its previous differentiation and specialisation disappear or become modified. In contrast to the processes of repair, this de-differentiation remains established.

IMPLANTATION.

The implantation group is interesting and demands a brief consideration, although we are dealing with cells which have undergone their carcinomatous mutation in another host. The corresponding experimental work, in which Russell, Woglom, and Murray have taken a prominent part, throws much light upon stroma reaction, species limitation, and individual refractoriness.

A true implantation consists of the transfer of living carcinomatous cells into a host in which they continue to thrive in situations in which epithelial tissue is not normally found. There are definite limitations to the capacity of the neoplastic cell in taking root in this way. The species limitation is extremely strict and in only one situation has a successful transplant been made from one species to another, when a mouse carcinoma was transferred to the brain of a rat. A few experimental tumours have become celebrat and are passed from one laboratory to another ow to their ready acceptance on implantation, wh places these tumours almost on the same plane the blood of a universal donor. When the destruct of an implant occurs, it is due to a fibrosis aid apparently, by the lymphocytic flood, in H. Wa phrase, which invariably appears. In a sub-effect excitation of the connective tissue, the stroma wh forms appears to be suborned to the service of the implant and, in place of a strangling and desiccating exterminant, it becomes an intermediary in the supply of such fluid as the carcinomatous cells require The influence of the fibrous barrier is shown in the arresting effect of an old pleuritic adhesion, occasionally in marked degree at the periphery of a melano-carcinoma and in other instances. The carcinoma cell may be reduced almost to the level of a spore, as shown by Heiman, of the Crocker Research Laboratory, when he implanted a very active carcinoma into the centre of a slow-growing transplantable fibroma of the rat.[7] In this fibrous prison the carcinoma survived but did not increase. On cutting up the composite tumour and liberating the contained cells, malignancy was rapidly demonstrated. Murray[8] has demonstrated that the resistance of the host is raised by the pre-existence of a cancerous implant which has been removed, and Lumsden[9] has claimed to raise resistance by some of the products of tumour autolysis. It is interesting to consider the possibility of a lowering of the anti-epithelial resistance in pregnancy which, as it permits the invasion of the trophoblast in the uterus, might also allow the acceleration of tumour growth in other parts, as has been frequently recorded. Although H. Ribbert's conception of tissue tension does not carry us far in relation to ætiology, it is of value as a description of connective tissue resistance against a carcinomatous invasion either by implant from another host or at the stage of irruption of the carcinoma cell from the epithelial zone.

This defence against epithelial invasion is, of course, evident with implants of normal epithelial tissue. If a small portion of a truly cut Thiersch graft be submerged into a connective tissue bed, it is invariably destroyed by fibrosis. It is only when a portion of "whole" skin, with its defensive barrier of corium, or an intact sebaceous or sudoriferous gland is disjoined and submerged that an implantation cyst is formed. In operative work the seeding of implants only occurs in conditions of malignancy, and the precautions against it, which Sampson Handley insists should be part of the ritual of every operation in cancerous cases, are never required in other work except the border states of independence such as the villous papilloma of the bladder.

In contrast to the fairly common observation of homo-transplantation by seeding, especially in breast work, it may well be understood that the transfer of a neoplasm from one human host to another will be as rare as its undesirability can make it.

Lecène and Lacassagne describe the case of a Frenc student who accidently inoculated his palm with tumou cells from a case of breast carcinoma by the breaking of syringe while he was in the act of withdrawing some exudat from the patient after operation. A neoplasm of the pal developed at the exact site of injury and a glandula metastasis made amputation of the arm necessary. O section the malignant nature of the growth was unquestionable.[10]

Parkes Weber showed recently to the Royal Society o Medicine the carcinomatous liver of an infant, aged 10 months, whose mother had died of melanotic carcinom three months after delivery. The mother had been operate upon, 18 months before delivery, for melanotic carcinom of the thigh. He described the case as the *first* reporte ansmission of a malignant neoplasm from mother to by intra-uterine inoculation.[11]

ll the recorded intentional attempts to transplant an tumour tissue have been unsuccessful. Some destroyed by fibrosis in the host. In the most nt attempt, which was reported to the German gical Congress in 1926 by Kurzahn, of Königsberg, graft failed to grow. This surgeon transplanted erous tissue from a breast into his own forearm. minations made at periods of six days, two weeks, six weeks showed only signs of absorption.[12] In arking that the result was quite different from e obtained in animals, he must have failed to ember that only a small proportion of spon- eous animal tumours can be successfully grafted d that the routine experimental work with a high portion of successful results is carried on with cultures of tumours of exceptional resistance to destructive agents in the host.

CONTINUING.

In amplifying the description of the group which have termed Continuing the renal tumour forms e chief basis, particularly in its brilliant description Nicholson in his work on "The Nature of Tumour ormation." The failure of differentiation in these mours is attributed, not to a fault in the cells, but a lack of the appropriate physiological stimulus to fferentiation, such as an aberration in development the capillaries.

As Nicholson affirms: "Cells will feed, grow, divide, d multiply for ever unless they are compelled by eir environment to make the effort to differentiate. his has been established by experimental methods in sue culture."[13] Some points from the summary of s analysis of the embryonic tumours of the kidney e :—

(1) They are congenital and represent enormously larged remnants of the renal blastoma of the embryo.

(2) They do not arise in cell rests but are cell rests.

(3) Their actively growing cells have always remained at early stage of embryonic development and have never oceeded beyond this stage of differentiation.

(4) These cells have retained the primitive physiological nction because they were prevented from undergoing the ocess of differentiation.

(5) The inhibiting influence is not an inherent fault in the lls but depends upon an anomaly of the environment to hich they were subjected at an early stage of their life story.

(6) There is evidence for the assumption that this anomaly of the nature of a defect of tissue correlation which may ave ceased to act long ago.

MacCarty, in a paper upon the Cancer Cell and Nature's Defence Mechanism, has described tissue ifferentiation in the human body as occurring in such way that it may be divided into three recognisable tages.[14] First, there is seen the establishment of the eneral alignment of the cells which is shown in the ormal arrangement of adult tissue, the cells themselves remaining undifferentiated; second, the establishment of cellular polarity; third, the establishment of the adult morphology of the cells. In the condition of no differentiation and in the first and second stages, the cells bear almost no resemblance to the adult form. Little is known of the active agents in this process of differentiation, whether it be nervous, vascular, or chemical, in so far as these are capable of separation, or whether a functional demand will evoke a stimulus to persistence and reproduction in a certain form on the principle by which Halsted has shown that a parathyroid graft will succeed where a deficiency of parathyroid secretion is present, whereas it will fail if introduced into a host with an adequate supply.[15]

What other tumours fall into this category of truly congenital and compass the ultimate destruction of the host through an early failure of his own differentiating capacity? The embryonal testicular tumours would probably furnish examples if more fully demonstrable. In the more rudimentary teratomatous groups which manifest themselves at an early age it is generally believed that the neoblastic tissue develops at the expense of other cell layers or types which had reached a slightly fuller differentiation. Ewing expresses the matter succinctly in regard to rate of growth:

> "Why one teratoma grows slowly and produces adult tissues while another develops rapidly and remains embryonal in type cannot readily be explained, and this variation may possibly call for a wide difference in the stage of development of the original cell. A more obvious factor is probably found in the influence of the blastomatous process which is usually added to the embryonic growth and converts the embryo into a true tumour. Beginning early, the blastoma may completely suppress the embryo or, if late, the embryo may reach the limit of its growth before the blastoma assumes serious proportions."[16]

It should be noted that Ewing adds something, the blastomatous process, to the embryonic growth. Nicholson appears to be reasonable in regarding the differentiation as the addition or superimposition. The growth of the differentiated tissue is slowed down, according to his view, and the blastoma represents unchecked growth.

The neuro-epithelioma and medullo-blastomata which usually appear about the age of ten years are ascribed to a residual, sequestrated group of cells which have persisted in undifferentiated form during a long lag period until some systemic influence, such as the action of an internal secretion or a fractional change in the pH content of the blood, leads to more rapid growth. Certain of the thyroid carcinomata and the hypernephroma group may be predetermined by a persistent undifferentiated deposit. One other group which must be included is the nævus cell carcinoma. In this melanoma the capacity for survival of an epithelial, or at least, in P. Masson's view, an ectodermal, cell in a connective tissue medium is a characteristic of the cell from the outset. It may wait for a long period before some form of trauma or chemical stimulus initiates the rapid proliferation of the frank carcinoma. Dawson believed that the fibrosis of the corium is the effective restraining agent throughout.[17]

It will be obvious that this Continuing group complies with the conception of Durante and Cohnheim of embryonal cell rests. Their views remain of value, although the extension of them to include all manifestations of the cancer process now receives very little support.

CONVERSION.

The Conversion group must be regarded as the most important. The Implantation group demands a place in a logical examination but the human examples are negligible in number. The Continuing group is larger but their nature practically precludes the possibility of experimental study, except upon the lines of genetics. Our hopes lie in a fuller undestanding of the Conversion group, and our reasonable expectation is that, with increasing knowledge, measures of prevention may reduce their incidence, as it has already done in some of the occupational examples of this type.

In the Conversion group the differentiated cell, or the germinal layer which is the less differentiated immediate antecedent of the fully adult type, is influenced by some change in environment to forsake its previous habit and morphology and to transmit the new characters through successive generations. From the standpoint of the host the process may rightly be regarded as a perversion. We desire, however, to maintain the physiology of the cell as the fundamental consideration, and we must assume that the modifications which occur are the inescapable results for a given cell of the influences which act upon it and so determine its conversion. The independence of the altered group of cells and their worthlessness to the general metabolism of the host are evidenced by the fact that their growth may reach its most exuberant stage when the host is reduced to the extreme of inanition.

General Factors in Conversion.

While it is desirable that the problem of cellular conversion should be regarded as a search for local influences, it should be stated that certain general factors are of importance in determining the degree of readiness by which the local changes are induced.

Heredity, in its racial and familial aspects, has an influence. The work of monumental patience and accuracy of Maud Slye would in itself confirm this view. It is evident that the same change in local environment may ultimately produce in one individual a carcinoma, whereas in others the result will not proceed beyond a local hyperplasia or papillomatosis. This is exemplified in the experimental application of carcinogenic substances such as gas-works tar. With a known tar and similar strains of mice the percentage of results can be estimated with considerable accuracy. It has been demonstrated that this varying degree of resistance is alterable by such factors as the presence or pre-existence of another carcinoma in the host. It happens also that the establishment of a carcinoma has the effect of raising the immunity of the host to such a degree that epithelial modifications which may be progressing towards malignancy are rapidly halted and may be cast off. The careful work of C. E. Dukes on the disappearance of all or a number of papillomata in the bowel and elsewhere is now fully confirmed. I have seen a similar change on the ears of this rabbit. On the establishment of a frank carcinoma at the edge of one ear a fairly rapid reduction in the number of the multiple keratinised papillomata took place before the animal succumbed.

The environmental factors to which the capacity of carcinogenesis has been ascribed are of such number and variety that it would not be profitable to attempt to enumerate them. Before proceeding to analyse the process of a chronic or constant mild irritation repair, this de-alirenupon which my thread is laid, I shall
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(*To be continued.*)

THE BRONCHOSCOPE IN THE DIAGNOSIS OF PULMONARY DISEASE.

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ACCURACY in diagnosis must always be the primar aim of any physician; for without a correct an limited diagnosis treatment cannot be scientificall applied.

The physician especially interested in diseases the chest can often arrive at an accurate diagnos quite speedily: by taking a careful clinical histor by making a complete examination of the orga of the thorax with his eyes, hands, and ears; examination of sputum macroscopically, mic scopically, and culturally; and by the intuiti process which comes mainly from the mental formed of a disease after seeing a large number cases. Only at this stage, and with the knowle gained before him, should the interpretation of shadows shown by the skiagram be undertak Yet in a certain proportion of cases, although possibilities in the differential diagnosis have b reduced in number by these examinations, there still some doubt as to the disease present, and a defi diagnosis may be of vital importance to the pati in point of view of treatment.

The same impasse, after clinical and radiolog examination has been completed, is met with diseases of other systems. In the intestinal urogenital tracts a more accurate diagnosis can o be arrived at by *visual* investigation, the sigmo scope, gastric camera, gastroscope, and cystos serving for these purposes; moreover there ca little doubt that it is more satisfactory to *see* the le than to postulate one by a process of elimina and deduction. Though the above-mentioned in ments have been used in their respective sp for many years, the bronchoscope, which was inve by Killian in 1898 and improved upon by Brü

1908, nearly twenty-five years ago, has been emely little used in the diagnosis of disease of the iratory tract. In this respect we have been iderably behind the Americans, who for several s have been describing it as a valuable adjunct ulmonary diagnosis and treatment. This failure se an instrument of so great value may have n due to the fact that up till recent years it has n in the hands of the laryngologist, whose modesty prevented him from advancing into the realms he chest physician; whilst the latter, on his side, been too shy to suggest that he might be surgeon ugh to examine the lungs of his patients.

Ve ourselves, having for some years been distressed he general inadequacy in this respect, considered dvisable to acquire the training necessary for the e use of this instrument in our work. Those of patients in whom diagnosis was in doubt, after rough investigation by other means, have been mined bronchoscopically, and form the smaller t of a series of 450 bronchoscopies carried out our clinic last year. The object of this paper o place on record the results of these investigations, d the conclusions formed therefrom.

In carrying out these investigations we have used pecially constructed bronchoscope with a telescopic achment, which gives a forward illumination nost equal to that obtained in the Haslinger strument. It has been constructed for us by . Schranz of the Genito-Urinary Company and a ll description will be published shortly after final provements have been made.

PULMONARY NEOPLASM.

A series of 25 cases were examined in this connexion d 21 of them were neoplastic. Bronchial carcinoma pears at the present time to be the most common rm of pulmonary neoplasm. The presumptive agnosis of this disease in the moderately advanced age is usually not difficult on consideration of the istory, clinical signs, and radiological examination; ut the assumption of malignancy cannot be *proved* ntil the disease has advanced to such a degree at secondary glands are available for section or etastatic deposits have occurred. In the moderately dvanced stage of the disease examination with the ronchoscope will usually show lesions which are eyond doubt, and allow of the removal of pieces f growth for section.

G. D., a man aged 50, was admitted twelve months ago ith a hæmoptysis. He had a scoliosis, with a boss which masked the X ray examination, which suggested fibrosis. Bronchoscopic examination showed a growth of the left ronchus and section showed this to be carcinoma. He had X ray therapy, and has recently died.

On the other hand, the bronchoscope may show that the lesion suspected as malignant is not so.

A. Y., a woman aged 60, had a breast removed for arcinoma seven years previously, and was sent to hospital with the diagnosis of secondary malignant disease on that side. The clinical signs were those of extensive fibrosis on that side, and the bronchoscope showed fibrosis only, with no evidence of malignancy.

J. D., male aged 45. The X ray diagnosis was neoplasm of the right root. He had a strongly positive Wassermann reaction, and bronchoscopy showed a fibrotic condition only, without evidence of malignancy.

If any successful treatment by surgery, radium, or X ray therapy can be evolved for the treatment of bronchial carcinoma, its success will depend on the earliest possible diagnosis; therefore one must be prepared to investigate with the bronchoscope all patients presenting any of the recognised early symptoms of the disease. One of the early symptoms may be hæmoptysis.

H. D., male aged 57. Three months before admission he was seen by a tuberculosis officer for hæmoptysis. Physical and radiological examinations were negative at this time. When seen as an out-patient he had definite signs at the right base, and bronchoscopy revealed a new growth which would probably have been equally obvious at the time of the initial hæmorrhage.

Another fairly early manifestation is collapse of a portion of lung distal to a bronchus occluded by growth. The accompanying signs and symptoms are probably the commonest early manifestation. They are generally an acute onset of pyrexia, pain, and cough, and are usually mistaken for pneumonia. After a somewhat prolonged course of four to five weeks, the symptoms abate and the patient feels better; nevertheless, the cough and physical signs persist.

H. N., male aged 44. Eight weeks before he came under our care he was admitted to a general hospital as pneumonia. After six weeks his condition improved, he became afebrile, and was discharged. Two weeks later he attended as an out-patient, when signs of collapse at the right base were confirmed by radiography. Bronchoscopic examination showed a carcinoma of the bronchus, which was confirmed by section.

L. G., male aged 50. Eight months before admission had "influenzal" pneumonia, and was treated at home for six weeks. Has had chronic cough and has never been well since. On admission he showed collapse at the right base, confirmed by radiography. Bronchoscopic examination showed carcinoma of the bronchus, and this was confirmed by section.

In both these cases bronchoscopic examination at the time of the "pneumonia" would have rendered diagnosis possible.

If the blockage in the bronchus is only partial, suppuration commonly occurs behind the obstruction, and the signs and symptoms are thus identical with those of lung abscess, and diagnosis can only be made by bronchoscopic examination.

W. N., male aged 55. On admission he had cough, pyrexia, and a small amount of purulent sputum. There were signs of consolidation and collapse of the right upper lobe. The skiagram suggested collapse, and showed no definite evidence of new growth. Bronchoscopy showed a new growth occluding the right upper lobe bronchus.

Less common are those cases presenting signs of pulmonary fibrosis, with or without bronchiectasis, and which have a prolonged course, often two or three years.

L. D., male aged 58, attended the out-patient department for two years with signs of pulmonary fibrosis at the left base with marked clubbing of fingers. During the two years there was no change in his condition, and a skiagram confirmed the presence of fibrosis. The patient was admitted for further investigation. Bronchoscopic examination showed a growth in the main stem bronchus just before the middle lobe bronchus, which was confirmed by section.

We wish to lay stress on the difficulty in getting these patients in the early stage of the growth. The patient in the earliest stages is perfectly well; hæmoptysis is not a *very* early symptom, and implies that the growth has ulcerated, and that it is highly probable that there is extension into the lung. Collapse also does not take place until the growth fills, or nearly fills, the bronchus. X rays show nothing until the lung has collapsed, and, even combined with lipiodol examination, will show nothing in the early stages before a considerable amount of occlusion has occurred.

It is essential that these cases be suspected earlier, at a stage when the growth is little more than a "wart" in the bronchus. Any middle-aged person, who has not been subject to coughs, and who develops a chronic cough, should be asked particularly if he feels any sensation of sticky mucus constantly in one place in the bronchus, if he has had any wheeze or rhonchus in one spot in the lung, which can be confirmed by stethoscope if present. If there is any constancy bronchoscopy is indicated. It is a procedure, which, in skilled hands, is devoid of risk and is no more unpleasant to the patient than a tooth extraction under local anæsthesia. By this means only will it be possible to get the disease in that stage when it is amenable to treatment by radium.

We have recently had a case in whom a growth had infiltrated from the bronchus to the extent only of a small walnut, and yet a secondary was present in the adrenal the size of a small orange.

PULMONARY SUPPURATION.

The diagnosis of pulmonary suppuration in its wider sense can usually be made on the history, physical examination, and the presence of purulent and often foul sputum. In the differential diagnosis of the cause and type of suppuration (e.g., pneumonitis, lung abscess, bronchiectasis, new growth or foreign body) bronchoscopy is of the greatest value, and we, with others, believe it to be an essential investigation in these cases The following synopses of case reports serve to bring out various points showing the value of bronchoscopic investigations in this class of case.

G. G., male aged 46. Sent from India for treatment of cough and foul sputum from which he had suffered for years. Physical examination revealed bronchitic signs, least marked at bases, and clubbed fingers. Skiagram nil. Lipiodol: widening of trachea. Sputum 12 oz. Bronchoscopy shows large bronchi generally and uniformly dilated, mucous membrane greyish and weeping pus. No evidence of bronchiectasis or abscess. The patient died later of pyæmia and autopsy confirmed findings. The case was one of purulent bronchitis.

C. G., male aged 16. Four months' swinging temperature, pain in right chest, cough and trace of sputum. Physical examination revealed consolidation at right base and clubbed fingers. Lipiodol was no help. We were asked by our colleague, Dr. Goodman Levy, to examine the boy with the bronchoscope. This examination showed that the external division of the right lower lobe bronchus was inflamed; it was dilated, a drainage tube passed and 2 oz. of thick pus was evacuated. A broncho-pneumogram confirmed the presence of an abscess cavity. The temperature fell, and after a few more treatments the patient was cured, and remains well.

In this case, for four months the diagnosis had been at fault owing to the fact that the bronchus of drainage was occluded. It is unusual for the diagnosis of pulmonary suppuration to remain so long in doubt.

J. R., a woman aged 35, after tonsillectomy developed a cough and fœtid sputum. She was seen by a chest physician, who diagnosed an abscess of the right lung. No special treatment was carried out, and for a year the patient went steadily downhill, with great loss of weight, sputum becoming more foul and more copious. Several skiagrams showed no definite lesion. Lipiodol revealed no abscess cavity. Bronchoscope showed pus coming from the bronchus supplying the upper part of the left lower lobe. Broncho-pneumogram showed the abscess cavity. On bronchoscopic drainage the patient is now well.

In this case there was no doubt as to the suppuration, but the exact nature of the lesion was not known until bronchoscopy was carried out, with the result that for a whole year the patient got steadily worse. Another point is brought out in connexion with this patient, and that is the value of defining the exact locality of an abscess by means of lipiodol placed down the bronchus of drainage under direct observation with the bronchoscope. In the ordinary case a much better lipiodol picture of the bronchial tree is obtained by the usual method of injection—e.g., crico-thyroid route, the oral method or the nasal catheter method, which last has incidentally been in use for several years on the continent. On the other hand, in a lung abscess the lipiodol given by [illegible] methods fails to enter the abscess cavity, [illegible] because the bronchus of drainage is obstructed [illegible] turgescent mucous membrane or because the [illegible] is full of pus.

By means of the bronchoscope the bronchus of drainage is dilated, the pus aspirated, and the [illegible] delineated with lipiodol.

The exact localisation is of the greatest [illegible] if the abscess subsequently requires treatment [illegible] surgical interference. Chevalier Jackson has [illegible] years maintained that all cases of pulmonary suppuration should be bronchoscoped because he believ[illegible] that a large number were due to foreign body. [illegible] may be a common cause in America, but we have [illegible] found it so in this country.

M. G., female aged 47. Tooth extraction four months before investigation. Pyrexia, cough, and purulent sputum with clubbed fingers, and signs of consolidation at right axilla. Skiagram confirmed consolidation. Bronchoscopy showed right middle lobe inflamed and pus pouring out. Aspiration was followed by coughing up a piece of tooth. Healed by bronchoscopic treatment.

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As we have previously pointed out in this paper, when a new growth has occluded a bronchus, and produced pulmonary suppuration, a diagnosis is made of suppuration, and the underlying neoplasm is missed. The only method of determining the true nature of the lesion is bronchoscopy.

In general the differentiation between lung abscess and bronchiectasis can be made on *history*, physical signs, and lipiodol examination. None the less in the investigation of a case of bronchiectasis the bronchoscope is of value. In the first place a new growth of foreign body can be excluded as the cause, and further the number of lobes involved can be ascertained as may the extent of dilatation of the main bronchus.

There is a type of bronchiectasis occurring in children and young adults in whom, whilst the physical signs are extensive, the sputum is small in amount or absent. The skiagram shows a cystic type of bronchiectasis. Bronchoscopy shows normal-sized main bronchi, whose mucous membrane is smooth and healthy, and, branching from the bronchi, numerous smaller bronchi not usually seen. This type we have suspected as being of congenital origin, allied to the cystic lung.

M. K., a thin pale girl aged 11, who has always led a normal life. The school doctor found signs in the chest and sent her to the tuberculosis officer, who transferred her to us. Slight cough, little sputum (not foul), and fibrotic signs over the whole of the left chest. Skiagram, with lipiodol, showed a cystic like condition. Bronchoscopy shows the main stem bronchi healthy, many small adventitious bronchi arising from the main stem. Artificial pneumothorax and thoracoscopy confirmed the evidence in favour of congenital origin.

In some cases of pulmonary suppuration, by obtaining the pus direct from the depth of the abscess, a pure specimen may be obtained for microscopical and bacteriological examination; spirochætes or other organisms not found in the sputum may be found, and intravenous novarsenobillon be given or a vaccine prepared, as the case may be.

Although the bronchoscope is of value in the diagnosis and localisation of pulmonary suppuration,

ncipal use in this disease is in the treatment of it.
not our intention in this paper to discuss its
a therapeutic method, for we propose to deal
his aspect later.

OTHER DISEASES.

ot uncommon diagnostic problem arises in cases
noptysis when clinical and radiographic examina-
give no evidence of disease. In the young
t tuberculosis is suspected, and in the middle-
or older neoplasm. A lipiodol examination,
have reported previously, may show an unsus-
l dry hæmorrhagic bronchiectasis, and should
ore always be done. A bronchoscopic examina-
hould also be made before resting content with
certain diagnosis.

previously stated, an early carcinoma may be
, whilst in young patients a swab taken from
ronchial mucous membrane and examined for
le bacilli may give a positive finding which
not otherwise have been obtained. Some
tion or a vascular area may be seen from which
æmorrhage has arisen, as the following case
ates.

., male aged 20. For three years repeated hæmoptyses.
l condition excellent. Physical signs and skiagram
re. Lipiodol negative. Bronchoscopy shows a cres-
vascular septum opposite the right middle lobe
us. This was cauterised with silver nitrate. There
en no further bleeding during the last nine months.

example of the value of a swab.

L., female aged 21. Cough and wasting some months.
al signs of infiltration at left base. Skiagram shows a
r in this region. No sputum. Fæces negative for
everal times. Bronchial swab T.B. present.

neoplasm involving the upper lobe bronchus
ncommonly activates an old tuberculous lesion,
are found in the sputum, and the diagnosis is
med. We have had several cases of this type
e doing our own bronchoscopy. Bronchoscopy
s of the diagnosis being cleared.

have found the examination of value in many
cases which do not come in the above group.
ollowing are examples :—

B., male aged 50. Cough, pain, and dyspnœa.
al examination suggested dilated aorta. Radiography
ned and showed a lesion of the right root, indefinite
agnosis. Wassermann reaction positive. Broncho-
showed mucous membrane of the right bronchus and
ons pallid. Plaster-of-Paris appearance very suggestive
cific infiltration and fibrosis.

F., male aged 56, showed all the signs of mediastinal
r. Radiological examination could not exclude
sm. Wassermann reaction negative. Bronchoscopy
d bronchial carcinoma.

CONCLUSION.

our opinion bronchoscopic examination is a
valuable additional method in the investigation
ulmonary disease. In some groups, neoplasm
suppurative condition, it is essential. It is a
od which does not disturb the patient unduly,
in experienced hands is quite safe. In some
bronchoscopies performed under local anæsthesia
e than one-third of which have been done on
patients, who have gone home two to three hours
the operation) we have never seen any ill-effects
not had a complaint from a patient. In those
nts who come regularly for treatment in suppura-
conditions the reverse is the case; their readiness
ubmit to repeated drainage raised our suspicion
the cocaine spray was the attraction, but the
titution of percaine for cocaine failed to diminish
desire for treatment.

EFFECT OF BRAIN DIET IN SUBACUTE COMBINED DEGENERATION OF THE CORD.*

BY C. C. UNGLEY, M.D. DURH., M.R.C.P. LOND.,

ROCKEFELLER MEDICAL RESEARCH FELLOW; RESEARCH FELLOW IN MEDICINE, HARVARD MEDICAL SCHOOL, AND MASSACHUSETTS GENERAL HOSPITAL, BOSTON, MASS.

THE reasons which led to the trial of brain diet have been described in a previous communication,[1] in which the potency of brain for blood regeneration in pernicious anæmia, as measured by the increase of reticulocytes and red blood-cells in four cases, was shown to be about one-third that of liver. The present paper describes an attempt to estimate the potency of brain relative to that of liver, with regard to their respective effects upon the neurological symptoms of pernicious anæmia. It was decided to use, whenever possible, patients whose neurological condition had failed to improve on liver pulp derived from 240 to 480 g. of raw liver daily, or on similar amounts of cooked liver. In a large series of cases of subacute combined degeneration of the cord at the Massachusetts General Hospital,[2] the Boston City Hospital, and the Royal Victoria Infirmary, Newcastle-upon-Tyne,[3] it was possible to find only a relatively small number of such instances. Of the nine cases described here, seven were of this type.

Method.—The brains of freshly killed oxen were used whenever obtainable. At other times frozen brain was used. After cleaning and passing through a meat grinder, 480 g. of the ground material were administered daily in three or four divided doses in the form of a purée with orange juice. This mixture makes a drink of more or less fluid consistency, which is taken usually without difficulty. The patients were confined to bed as little as possible, and, although they were encouraged to walk, no re-educational exercises were instituted.

CASE RECORDS.

Nine cases have been treated with whole brain for from two to six months. Six improved and three cases failed to show improvement.

CASE 1.—A man, aged 50, had subacute combined degeneration of the cord, with signs of gross involvement of posterior and lateral columns. Neurological symptoms were of fourteen months' duration. Symptoms referable to anæmia had been present for three months before the neurological manifestations commenced. At first liver therapy had been irregular and inadequate. For the last five weeks, however, he had taken daily "domestic" extract[4] derived from 240 g. of liver, and for eight weeks before that commercial extracts derived from approximately 600 g. of liver together with 240 g. of raw liver pulp. His general condition greatly improved with disappearance of the anæmia, but without as yet any improvement in the neurological symptoms.

At the *commencement of brain diet* he was unable to stand alone, and required the help of two persons to walk even a few steps. He was unable to dress or undress himself or to write. Numbness and tingling involved the extremities, reaching to the elbows and to the knees. Red blood-cells numbered 4·53 millions per c.mm. The upper limbs showed diminished power with hyper-active deep reflexes, and Wartenberg's thumb sign[5] was positive bilaterally. Gross astereognosis was present with inability to recognise any except large objects. There was considerable loss of power in the lower limbs, with gross incoördination, absence of joint-position sense in the toes, and absence of vibration sense (C,128) below the knees. The knee- and ankle-jerks or rhonchus in one spot in the lung, which can be confirmed by stethoscope if present. If there is any constancy bronchoscopy is indicated. It is a procedure, which, in skilled hands, is devoid of risk and is no more unpleasant to the patient than a tooth extraction under local anæsthesia. By this means only will it be possible to get the disease in that stage when it is amenable to treatment by radium.

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* A paper read before the fifty-seventh annual meeting of the American Neu . . . Boston, 1931. From the Medical and . . . sachusetts General Hospital, and the . . . of the Harvard Medical School; Bosto . . . Royal Victoria Infirmary, Newcastle-on-Tyne.

We have recently had a case in whom a growth had infiltrated from the bronchus to the extent only of a small walnut, and yet a secondary was present in the adrenal the size of a small orange.

PULMONARY SUPPURATION.

The diagnosis of pulmonary suppuration in its wider sense can usually be made on the history, physical examination, and the presence of purulent and often foul sputum. In the differential diagnosis of the cause and type of suppuration (e.g., pneumonitis, lung abscess, bronchiectasis, new growth or foreign body) bronchoscopy is of the greatest value, and we, with others, believe it to be an essential investigation in these cases. The following synopses of case reports serve to bring out various points showing the value of bronchoscopic investigations in this class of case.

G. G., male aged 46. Sent from India for treatment of cough and foul sputum from which he had suffered for years. Physical examination revealed bronchitic signs, least marked at bases, and clubbed fingers. Skiagram nil. Lipiodol: widening of trachea. Sputum 12 oz. Bronchoscopy shows large bronchi generally and uniformly dilated, mucous membrane greyish and weeping pus. No evidence of bronchiectasis or abscess. The patient died later of pyæmia and autopsy confirmed findings. The case was one of purulent bronchitis.

C. G., male aged 16. Four months' swinging temperature, pain in right chest, cough and trace of sputum. Physical examination revealed consolidation at right base and clubbed fingers. Lipiodol was no help. We were asked by our colleague, Dr. Goodman Levy, to examine the boy with the bronchoscope. This examination showed that the external division of the right lower lobe bronchus was inflamed; it was dilated, a drainage tube passed and 2 oz. of thick pus was evacuated. A broncho-pneumogram confirmed the presence of an abscess cavity. The temperature fell, and after a few more treatments the patient was cured, and remains well.

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diseases of other origin.

urogenital tracts a pulmonary suppuration, by be arrived at by *visu* from the depth of the abscess, scope, gastric camera, obtained for microscopical for these purpo mination; spirochætes or it is mor in the sputum may be one arsenobillon be given or a Though se may be.

In some cases of obtaining the pus direct a pure specimen may *be* used and bacteriological exam bronchoscope is of value in the other organisms not found and in pulmonary suppuration, intravenous now arked in degree, and involved the legs up to the nd each arm to a level well above the elbows. There arked pyorrhœa. The radial arteries were grossly ed, calcified, and tortuous. The cranial nerves ormal except for slight nystagmoid movements. pper limbs showed increased deep reflexes with e Hoffmann, Wartenberg's, and "paradoxical flexor-r" reflexes on the right side. In the lower limbs as some loss of power, and marked incoördination; ense was lost in the toes and ankles, and vibration was absent up to the hips. The knee- and ankle- were exaggerated and the plantar reflexes were sor" in type on stimulation of either outer or inner f the feet. Liver therapy was discontinued, and of raw ox brain was given daily.

e *end of six weeks* the red cell count was 4·5 millions nm. He was able to walk well, resting his hands arm-chair which he pushed before him. Numbness gling had diminished to the level of the wrists, and knees.

he *end of eight weeks* he was able to walk with a stick, en to manage a few steps without it.

he *end of ten weeks* the red blood-cells numbered llions per c.mm. He was now able to walk alone the ward without using the stick. Coördination of gs was very much improved, and there was some of joint sense in the toes. Spasticity was less, and ep reflexes less active. Some loss of weight had ed, but not enough in itself to account for the red gait.

ract No. 343 (N.N.R.) derived from 400 g. of liver w given daily in addition to the brain, but, in spite , the red cell count diminished further to 2·8 millions gh the neurological improvement was maintained. s point brain diet was discontinued and liver extract 3 (N.N.R.) derived from 1000 g. of liver was substituted. ed cells slowly increased to 3·4 millions per c.mm. riod of thirty days, at the end of which time resource ad to liver therapy by the intramuscular route.[7] aily injection of liver extract derived from 10 g. of for thirty-two days was accompanied by a further increase of red blood cells to 3·85 millions per c.mm., here was some further increase in strength.

is case showed rapid neurological improvement rain after failing to respond to similar quan- of liver. It is interesting, moreover, that the ovement took place despite the falling red blood- ount. The slowness of the subsequent hæmo- ic response to liver extract by mouth and also terally seems to indicate that this patient was considerable extent "refractory," and it can be ly understood why the red blood-cell count fell g the period of administration of brain. The of Beebe and Lewis[8] suggests that larger amounts tent material are required to maintain the red d-cell level in elderly than in young patients, cially if arterio-sclerosis is present.

e following two cases showed slighter degrees of ovement.

SE 5.—A widow, aged 59, had shown only slight ovement in gait, and no improvement in paræsthesiæ g treatment with 240 g. of raw liver daily for a year, with varying amounts of liver and liver extract before . Ox brain, 480 g. was given daily together with liver act No. 343 (N.N.R.) derived from 100 g. of liver, h was added in an endeavour to prevent a relapse of anæmia.

the commencement of brain treatment numbness and ing were particularly marked. Moreover, light touch e distribution of the paræsthesiæ evoked such intense widespread pain that thalamic involvement was ected. After seven weeks the numbness and tingling decreased very markedly, the hyperæsthesia of the ds is no longer evident, and there has been slight further ovement in her ability to walk. During this time the ell count fell gradually from 4·9 to 4·25 millions per c.mm.

SE 6.—A coal-miner, aged 59, had shown little or no ological improvement with about 1400 g. of cooked r per week for a year. While taking 240 g. of cooked n daily (i.e., three and one-half pounds a week) there almost complete cessation of flexor spasms of the legs, ch, accompanied by arching of the spine, had caused considerable discomfort. Paræsthesiæ improved in ree but not in extent, and his ability to walk was somet increased.

In three cases (Nos. 7, 8, and 9) the administration of 480 g. of raw ox brain daily produced no neurological benefit in a period of four months.

Case 7 was a married woman, aged 60, whose neurological symptoms had previously failed to respond over several years to relatively small amounts of liver and liver extract, including 240 g. of raw liver daily for five months.

Case 8.—A man, aged 63, was an advanced bedridden case with complete paraplegia in flexion and incontinence of urine, together with bed sores and urinary infection. He became worse, even though for four months liver extract derived from 600 g. of liver was given daily in addition to the brain.

Case 9.—A man, aged 46, had relatively slight neurological involvement but failed to benefit from brain diet even when combined with liver extract derived from 400 g. of liver and with thyroid medication.

ANALYSIS OF THE EFFECTS OF BRAIN DIET IN THE SIX IMPROVED CASES.

Five of these cases received daily 480 g. of raw ox brain, and the other received 240 g. of cooked brain. Case 5, noted above as having shown improvement of lesser degree, received daily, in addition to the brain, liver extract No. 343 (N.N.R.) derived from 100 g. of liver. With this exception, the neurological improvement occurred while brain diet alone was taken.

Of the six cases, four showed marked improvement, and in two the improvement was slight. The four which improved most were advanced cases which had previously failed to respond to from 240 to 700 g. of liver daily, the average daily amount being about 440 g. In two of them the liver dosage had been as much as 480 g. daily for six and seven months respectively.

Nervous System.—With brain diet four of the six cases showed distinct neurological improvement which was manifest within eight weeks. Formerly bedridden, they regained their ability to stand alone, and two became able to walk unaided; the other two could walk with the assistance of crutches or by holding furniture. Incoördination and ataxia greatly improved, and numbness and tingling decreased in extent and in intensity. Astereognosis, present in two cases, showed striking improvement in one instance and moderate improvement in the other. Vision improved in two instances and in one case there was, in addition, a notable improvement in memory. Sphincter disturbances, comprising difficulty and urgency of micturition, which were present in three cases, cleared up completely in one patient, and improved in another. The deep reflexes of the lower limbs, which had been exaggerated in two cases, became less active, coincident with a decrease in spasticity. The "extensor" plantar reflexes showed no significant alteration. Vibration sense (C, 128) returned in the lower extremities in one instance; in another patient, vibration sense returned to the bones of the hand and forearm although remaining absent in the legs. The latter case showed, in addition, a return of joint sense in the fingers. Three other cases showed some return of joint sense in the toes. One of the markedly improved cases subsequently relapsed following an upper respiratory infection, both the blood and the neurological symptoms being affected.

The improvement of lesser degree which occurred in two of the six cases has been described.

The Blood.—During the period of brain diet, and coincident with neurological improvement, the red cell count gradually diminished in four instances as follows: from 4·4 to 4·2, 4·0 to 3·2, 4·8 to 3·7, and 4·9 to 4·3 millions per c.mm. In each case it was considered desirable, after periods varying from two to six months, to add or substitute liver or liver extract in order to combat anæmia. The significance of these findings is discussed below.

were exaggerated, and the plantar reflexes extensor in type. He was instructed to discontinue liver and to take one pound (480 g.) of fresh raw ox brain with orange juice, daily.

After five weeks the red cell count was 4·4 millions per c.mm. He was now able to stand alone and to walk without help, occasionally steadying himself by holding on to objects as he passed them. He could undress without aid, though he still needed help to dress. Paræsthesiæ had diminished greatly in degree, and no longer interfered with sleep. The level of numbness had decreased to the wrist and ankle. Stereognosis had greatly improved, so that he could recognise any test object. There was an increase in the power of the upper and lower limbs, and coördination of the legs had considerably improved.

After fourteen weeks the red cell level was 4·2 millions per c.mm. He could now walk alone without holding objects to steady himself, and could run for a short way with help. Except for assistance with very small buttons he was able to dress himself, and he recommenced to shave himself, using a "straight" razor. There was greater strength in the limbs, and coördination of the legs was only slightly impaired. There was slight improvement in joint sense, but no return of vibration sense, nor any change in the plantar reflexes. He continued to improve, so that he was able to climb stairs without difficulty. Six months from the commencement of brain diet he suffered a gastro-intestinal upset in which nausea and vomiting occurred with a feeling of general weakness. Two weeks later the red cell count had fallen to 3·5 millions per c.mm. and paræsthesiæ increased, but there was no increase in incoördination. Liver therapy was temporarily substituted to combat the anæmia. A few days later the feeling of weakness had practically disappeared, and it was clear that the neurological improvement which had developed during the period of brain treatment had not been seriously affected by the relapse of the anæmia.

The neurological improvement in this case was rapid and occurred in spite of a gradually falling red blood-cell count.

CASE 2.—A farm hand, aged 39, entered the hospital with subacute combined degeneration of the cord of two years' duration. For seventeen months he had taken about 960 g. of cooked liver a week, with liver extract No. 343 (N.N.R.) derived from 300 g. of liver daily. For the past six weeks he had been given from 480 to 700 g. by weight of raw liver daily while in hospital. Symptoms referable to anæmia had disappeared, and his general condition was excellent, but the neurological symptoms had become worse even during the last six weeks.

At the *commencement of brain diet* the red blood-cells numbered 4·2 millions per c.mm. He was unable to stand or to walk even with the assistance of two persons. Memory was somewhat impaired, and his vision was defective. He was troubled with urgency of micturition. Numbness and tingling were present in the finger-tips, and in the legs up to the calf. The cranial nerves showed no evidence of abnormality except for slight nystagmoid movements. The upper limbs showed slight incoördination and diminished vibration sense; the deep reflexes were increased, with positive Hoffmann's and Wartenberg's reflexes on the right side. There was marked loss of power in the lower limbs with gross incoördination on the heel-knee test and almost complete loss of sense of position. Joint sense was absent in the great toes and vibration sense (C,128) absent below the twelfth dorsal vertebra. The knee- and ankle-jerks were absent and the plantar reflexes showed an "extensor" response on stimulation of either the inner or the outer sides of the sole; Oppenheim's sign was positive. The basal metabolic rate was minus 13 per cent.

Liver treatment was discontinued, and 480 g. by weight of raw ox brain pulp were administered daily.

After seven weeks the red cell count was 4·98 millions per c.mm. He was now able to get out of bed alone, and stand upright by steadying himself slightly. He could walk about the ward easily with two hands resting on a chair. Memory had greatly improved and his handwriting was better. Visual acuity had increased so much that he was now able to read a newspaper easily. The urgency of micturition had ceased, and numbness and tingling had disappeared from the legs. The lower limbs showed an increase in power, with much improved coördination. Reflexes were unchanged and joint sense only slightly improved, but there was a partial return of vibration sense in the toes, tibiæ, and ilia. He has continued to improve at home, and now after four months of brain diet, about 480 g. a day, he walks alone on crutches.

Noteworthy is the rapidity of the neurological improvement, affecting memory, vision, sphincter control and vibration sense in addition to gait, coördination, and paræsthesiæ.

CASE 3.—A plasterer, aged 50, entered the hospital with subacute combined degeneration of six years' duration. Symptoms referable to anæmia began two years before entry. For the past six months he had taken, regularly, about 480 g. of raw liver daily. His general condition and anæmia had improved markedly, but the neurological condition had progressed unfavourably.

At the *commencement of brain diet* red cells numbered 4·0 millions per c.mm. He could not stand, and needed the assistance of two persons to walk even a short distance. Numbness and tingling involved the fingers and palm of the hand, and the legs up to the waist. There was a central scotoma in each visual field, possibly attributable to tobacco. Micturition was difficult at times, with urgency. Examination of the upper limbs showed some loss of power, impaired coördination, absent vibration sense in the hands and at the wrist, grossly defective joint sense in the fingers and very marked impairment of stereognosis. The deep reflexes were exaggerated with positive paradoxical flexor-extensor response. The lower limbs showed loss of power with increased tone, gross incoördination, loss of joint sense in the toes, complete loss of vibration sense below the waist, and impairment of skin sensibility to pin-prick or light touch below the knees. The knee- and ankle-jerks were exaggerated, with patellar and ankle-clonus, and the plantar reflexes were "extensor" in type on stimulation of either outer or inner sides of the soles of the feet; Oppenheim's sign was positive on the right side. The basal metabolic rate was minus 19 per cent.

Raw ox brain, 480 g. in orange juice, was given daily and liver therapy discontinued.

After four weeks the red cell count had diminished gradually to 3·6 millions per c.mm. Power and coördination of the legs were much improved. He was able to stand alone for short periods, and to walk well with a chair. Numbness and tingling had decreased in intensity and in extent, now reaching only as high as the knees.

After eight weeks the red cell count had fallen to 3·2 millions per c.mm., but he continued to improve neurologically. Strength and coördination of the limbs were increased, visual acuity was greater, and stereognosis had improved. There was a return of vibration sense in the hands but not in the legs, and some return of joint sense in the fingers. The legs were less spastic, deep reflexes were less active, and Oppenheim's sign was negative.

After ten weeks, however, he had a relapse following an upper respiratory infection in which the red blood-cell count fell to 2·8 millions per c.mm. and in which the neurological symptoms also increased. Finally brain treatment was abandoned in favour of liver extract parenterally.'' He has received intravenously, over a period of seventeen weeks, extract derived from a total amount of 2110 g. of liver, and subsequently, by the intramuscular route during a period of four weeks, extract derived from 250 g. of liver. The red blood-cell count reached 4·9 millions per c.mm. after seven weeks, during which time there was considerable decrease in extent and degree of paræsthesiæ. In spite of this somewhat intensive course of liver treatment, although there was considerable gain in strength and improvement in general health, which enabled him to walk more readily with a walking chair, neurological signs remain unchanged and he is still unable to stand alone.

This case showed remarkable neurological improvement with brain diet, although the symptoms had progressed while taking similar amounts of whole liver. The improvement took place in spite of the fact that the red blood-cell count was falling. The relapse which subsequently occurred, affecting both the blood and neurological symptoms, appeared to be due to the upper respiratory infection. The subsequent administration of liver extract parenterally brought about improvement in the blood and in the general condition, but apart from a decrease in paræsthesiæ, there have not been, as yet, any signs of neurological improvement since the relapse.

CASE 4.—A pedlar, aged 69, male, first had symptoms referable to anæmia three years previously, with neurological symptoms for the past two years. Liver treatment was begun at the time of onset of the anæmia, but had at first been irregular. For the past seven months, however, he had taken about 480 g. of raw liver daily, missing never more than one or two days per month. Although his general condition was excellent, and the anæmia had disappeared, the neurological symptoms had become severe.

At the *commencement of brain diet* the red cell count was 4·8 millions per c.mm. The basal metabolic rate was minus 9 per cent. and his weight was 227 pounds. He was unable to stand unaided, and required assistance to walk even a few steps and to get in and out of bed. Micturition was difficult, with urgency at times. Numbness and tingling æmia.[2] The presence of an achlorhydria has led ıny to suppose that the abnormal blood picture seen but an early and immature manifestation of rnicious anæmia, and as a consequence it is often ıght that the nervous changes may precede the lly formed blood picture. The introduction of 'er therapy has distracted our attention from the :t that the blood picture in many cases never ıtures into one of typical pernicious anæmia, since is believed that treatment with liver has prevented is. Thus what appears to be a most important thological feature of the disease has not been fficiently emphasised.

Since 1930 it has been shown by L. J. Witts[3] d others that achlorhydria is associated not only th primary or macrocytic anæmia, but also with condary, chlorotic, or microcytic forms. The acrocytic anæmia, as we know, responds to liver erapy, whilst the microcytic anæmia makes good coveries under large doses of iron. In the Medical nit at St. Mary's Hospital this latter mode of eatment, advocated by Witts, has been employed r several months and results obtained which amply stify the claims made for it; when liver treatment as failed, several cases of microcytic anæmia with chlorhydria have made complete recoveries by the lministration of large doses of Blaud's pill.

W. B. Castle[4] in a series of classical experiments as demonstrated that it is a deficiency in gastric :cretion which is responsible for the changes in the lood picture in macrocytic anæmia, but at present ıe reason why, given a primary achlorhydria, either ıacro- or microcytic anæmia may develop is ndecided; nor do we know what circumstances etermine how the blood picture will shape.

Bearing these considerations in mind, it seemed to ıe just possible that in subacute combined degeneration iron might be more essential than liver in the reatment, although it was realised that iron in large osage must have been used previous to the introuction of liver therapy, without, apparently, ny marked beneficial result. It was therefore letermined to apply *massive* dosage, provided that ıo toxic symptoms developed, and grs. 150 of Blaud's ill a day have been given without harmful effects.

Since only four cases have been treated, an estimaion of its value must be of a purely tentative nature, out the excellent results achieved in three out of the four cases, and the marked improvement made by the fourth, suggest an element of truth in our hypothesis. Some difficulty has been found in trying to collect many cases of subacute combined degeneration, in which the signs were sufficiently developed to establish the diagnosis with fair certainty, but as no reference elsewhere to treatment by "massive iron" therapy has been found, the results obtained by this method seem worthy of record in order that it may be given a more extensive trial.

CASE RECORDS.

CASE 1.—A man, aged 62, sent up by his doctor on Oct. 17th with a diagnosis of cerebellar disease. Discharged from work two years ago, owing to his ataxia and danger of falling into the machines which he was working. For the last six months he had grown steadily worse, and on admission could not walk more than a few yards without stumbling or holding on to objects for support. After being in bed for two days, he could not walk without falling over. Rombergism well marked. Complained of stumbling about, giddiness, weakness of legs and arms, pins and needles in hands and feet. Some incontinence of urine. Legs drawn up involuntarily in bed at night.

Examination showed diminution of tactile sensation in many areas. Temperature sensation impaired on lower jaw and left forearm. Absence of vibration sense below right knee. Some lack of positional sense. Deep reflexes of arms and legs exaggerated, more so on the right side. Positive Babinski on left side, and doubtful on right. No ankle-clonus elicited. Complete achlorhydria present. Cerebrospinal fluid tests were all negative; Wassermann reaction negative. Blood count on admission showed hæmoglobin, 68 per cent.: red cells, 3,330,000: colour-index, 1·0; and white cells, 9600. No polychromasia or nucleated red cells present.

Patient was treated by administration of Blaud's pill grs. 50 three times a day. He was allowed up only in the evening, and no massage or exercises were given. No liver was given in this case. Three weeks after admission he could get straight up out of bed and walk with very little ataxia. Five weeks after admission he was able to walk up and down a few stairs without holding on to the banisters. Seven weeks after admission he insisted on going home, as he said he felt quite well. Seen ten days later, when he walked up and down two flights of stairs without any visible sign of ataxia. On examination sensation was normal over the whole body, all thermal sense restored and use of hands much improved. He had lost all feelings of pins and needles in his hands, but vibration sense had not completely returned to his right leg, though he could now appreciate its presence. There was still some weakness of right arm present and exaggerated reflexes in right arm and knees. Left Babinski now flexor, but the right still doubtful. Sphincter trouble gone. Was thinking of returning to work in February. Blood count showed Hb. 70 per cent.; red cells, 4,400,000: C.I., 0·8; white cells, 6400.

Seen again after Christmas, he said he went over to party at friend's house and feels rather tired, but is still walking perfectly well.

CASE 2.—Woman, aged 36, sent up for anæmia by doctor who had been treating her with liver for some time, but without the patient making any progress. On examination on Nov. 26th she was seen to be anæmic, Rombergism was present to a marked degree, and she swayed helplessly when asked to walk along a straight line. Complete absence of vibration sense in both legs. Both knee-jerks were exaggerated, the right more so than the left. Babinski's sign absent; no ankle-clonus. This appeared to be an early case of subacute combined degeneration. Treated with Blaud's pill grs. 50 three times a day, and liver therapy which had been used by her doctor was continued. Not allowed out of bed for a fortnight and no massage given. At the end of a fortnight she was allowed up and asked to walk. Rombergism was now absent and patient could walk along a straight line. Put in bed another week: condition still more improved at the end, and could walk along a straight line placing one heel in front of preceding toe, a severe test for coördination, with ease. All signs have completely cleared up, and vibration sense is now appreciated in both legs, where before it was totally absent. Blood count has risen from Hb. 30 per cent.; red cells, 1,830,000: C.I., 1·1: white cells, 38,000; (relative lymphocytosis), to Hb. 74 per cent.; red cells, 3,270,000; C.I., 1·1; white cells, 7000. Patient is still under treatment for the anæmia. She says that all feeling of heaviness and stiffness has left her legs.

CASE 3.—Woman, aged 50, admitted to Medical Unit in June, 1931, complaining of pain in back and some tingling in fingers. She also said that she was unsteady and could not walk any distance without becoming tired. On examination the gait was found to be slightly ataxic, Rombergism was present but not marked, and vibration sense was lost in both legs. The reflexes were all normal except for exaggeration of the right knee-jerk. Complete achlorhydria present and blood count showed Hb., 39 per cent.; red cells, 4,300,000: C.I., 0·4; and white cells, 5000. Diagnosed as a case of subacute combined degeneration. Massage for legs and full liver diet were given, and patient was sent out on the liver diet, having made some improvement.

Written for on Nov. 14th to try the effect of the new treatment. She now complained that she could not walk more than a mile without her right foot turning over, and her husband said that when this occurred she became very ataxic, and he had experienced some difficulty in getting her home. She had not been able to do any housework or cook the meals. Additional signs were now present in spite of the liver treatment. The right leg gave a positive Babinski sign and both ankle-jerks could only be elicited with great difficulty; the knee-jerks were not exaggerated. Absence of vibration sense was present as high as the mid-thoracic region of the spinal column. Frequent attacks of incontinence of fæces were also occurring.

Treated with Blaud's pill grs. 50 three times a day for three weeks in the ward and since then as an out-patient. A marked improvement in general health has occurred; her husband reports that he accompanied her on a three-mile walk and no signs of ataxia or weakness of the leg developed. She has only had one attack of incontinence of fæces since returning home. Vibration sense has returned as low down as the mid-lumbar region, but it can only be very feebly

DISCUSSION.

The results obtained suggest that ox brain may exert a beneficial effect upon the neurological phenomena of pernicious anæmia. It is necessary to decide how much of the improvement can be attributed to the effects of brain diet. Although Oppenheim[9] and Curschmann[10] believe that, in the absence of treatment, "natural" remission of the neurological manifestations may occasionally happen, such an event must be extremely rare, and Collier[11] states that "any improvements which occur are improvements in the general health and in the anæmia, rather than any lessening of the gravity of the nervous manifestations." Russel[12] expresses a similar opinion. It therefore seems unlikely that the neurological improvement during brain therapy could be attributed to spontaneous remission.

The question also arises as to whether the improvement which occurred in six of the nine cases during brain treatment could be attributed to an effect carried over from the previous liver therapy. In four patients (Nos. 3, 4, 5, and 6) liver treatment had been taken without significant neurological benefit for sufficient lengths of time to rule out any likelihood that, in the absence of brain diet, improvement would have commenced after liver had been discontinued. In two cases (Nos. 1 and 2), however, the periods of administration of moderate to large amounts of liver (240 to 700 g. daily) which preceded the brain treatment were relatively short—namely, 13 weeks in one case and six weeks in the other. In the longer of these periods, at least, one would expect some, although not maximal, neurological benefit. But since, during the administration of liver for these lengths of time, one patient had shown no improvement whatever, and the other had become worse, and further, since improvement promptly occurred during subsequent brain therapy, it is very improbable that the beneficial effect could be attributed to the liver previously ingested. Moreover, the fact that neurological improvement continued for six months and four months respectively, with brain diet in the absence of liver, is further evidence that this benefit is unlikely to have been a remote result of the previous liver treatment.

With regard to the three patients who did not improve, it should be pointed out that one, who was in the terminal stages of the disease, with complete paraplegia in flexion and incontinent sphincters, was also suffering from urinary sepsis and bed sores. Such complications have been shown to adversely affect the response to liver therapy of the neurological condition.[2 3] It is known that, even in the absence of septic complications, there are certain cases of subacute combined degeneration which fail to show neurological improvement when treated with large amounts of whole liver over periods of many months.[2] This lack of response may perhaps be due to defective absorption or utilisation of the active principle or to its destruction in the gastro-intestinal tract. Some such explanation possibly accounts for the lack of improvement in the other two patients, one of whom had already failed to respond to 240 g. of raw liver taken daily for five months.

In the improved cases the effect of brain appeared to be greater than that of the liver previously taken, but only in Cases 3 and 4 were the amounts of liver and brain in any way comparable weight for weight. The evidence is as yet insufficient for any accurate comparison of the relative potencies of liver and brain for producing neurological benefit.

However, if the hæmopoietic potency of ox brain is taken as about one-third that of liver, then six out of nine cases improved neurologically on a diet which was less potent for blood regeneration than that of the previously ingested liver. This is also emphasised by the fact that in all cases, except Nos. 2 and 6, the red cell count diminished during the period of neurological improvement.

If the results are confirmed, it would appear that the effect of brain diet upon the nervous system is markedly disproportionate to its effect upon the bone-marrow, when compared to the relative effects of liver upon these two systems. The findings tend to support the hypothesis that the effect of organ therapy upon the nervous system in this disease is not wholly the result of maintenance of the red blood-cell count at a high level, and that there may exist in liver and in brain a factor beneficial to the lesions in the nervous system, distinct from that which influences the regeneration of blood. Mellanby[13] has suggested that fat-soluble-A may be the factor responsible, but brain contains little or none of this vitamin.

Owing to its low potency for blood regeneration brain is not suitable for the routine treatment of subacute combined degeneration unless combined with amounts of liver or potent substitute adequate to maintain a normal blood picture.

I am indebted to Dr. J. B. Ayer, Dr. J. H. Means, and to Dr. J. Lerman at the Massachusetts General Hospital for their helpful coöperation. I am indebted also to Dr. G. R. Minot and Dr. Stanley Cobb fo allowing me to treat cases in their wards at the Boston City Hospital.

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TREATMENT OF

SUBACUTE COMBINED DEGENERATIO OF THE CORD

BY MASSIVE IRON DOSAGE.

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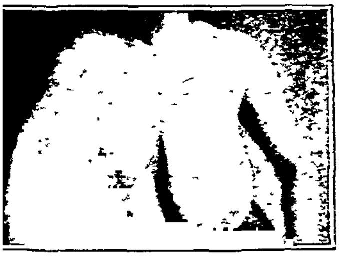
IT has now come to be recognised that in the trea ment of subacute combined degeneration of the co liver therapy is usually of little or no use, in fa the disease often progresses in spite of its administra tion. Of late, various experimenters have gone in new fields of research in an attempt to find some oth factor at work to produce these nervous change Prof. E. Mellanby,[1] for instance, has publishe research which inculpates vitamin A deficiency.

Several observers for many years have pointed ou that in cases of subacute combined degeneration, th blood picture is rarely that of a typical pernicio ing skin is flushed and feels hot to the touch. The ysical signs are those of a diffuse inflammation, as om a mild grade of infection or from a premature ortive attempt at lactation. Sometimes a little ear milky fluid can be expressed from the nipple.

As may be expected, the condition often causes arm to the parents and distress to the patients. hilst it is true that these inflammatory signs usually bside spontaneously in the course of a few months, the breast returning to a size within the limits of normality, occasionally it remains unduly large and heavy, the gland itself harder and more sharply defined than is normal. Sometimes, no doubt, return to the normal is ultimately reached by way of lactation later; e residue probably constitute those cases of massive ypertrophy which require treatment in adult life.

FIG. 1.



rue hypertrophy of corpus mammæ. Result of first operation.

In the pendulous, flaccid breast which sometimes llows lactation the gland itself is merely prolapsed, nd the condition is so classified by Dartigues,[1] who as written extensively on this subject. There is no ypertrophy of the gland tissue; no symptoms, as a ule, ensue, and treatment is not invited unless the atient, for purely æsthetic reasons, demands correcion of what may seem to her a deformity from which he considers she has the right to escape.

In quite a different category are those cases in hich there is a true hypertrophy of the corpus mammæ, breasts so grossly enlarged (Fig. 1) that hey constitute a burden and a handicap to their nfortunate possessors. So enormous may these ecome that they rest upon the lap of the patient when he is seated. The mere weight and bulk of the breasts ften cause a stooping gait—according to Dartigues an actual kyphosis. There is usually some tenderness on palpation, the superficial veins are unduly prominent and the skin dusky, even cyanosed, particularly around the nipple, which is always displaced towards the lower pole of the breast. Pain, dull. aching and dragging in character, is almost invariable, compelling the patient eventually to seek relief. In the majority no discrete tumour can be felt, but many are manifestly affected by a mazoplasia or a cystic mastitis; indeed, it is doubtful if any mammary gland so excessively enlarged can be regarded as healthy, a fact which influences decisively the manner of treatment necessary. Mental depression is a frequent concomitant, varying widely according to the temperament of the individual, and may, according to Kausch,[2] induce suicidal tendencies.

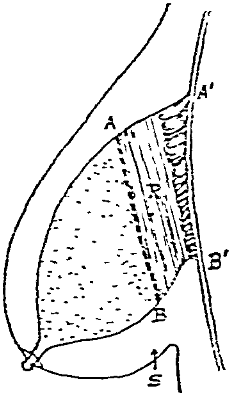
THE EFFECTS OF STASIS.

The tissues of such breasts must clearly suffer deleterious effects from stasis of their circulation and secretions, the penalties of which have been emphasised in recent years by various authors—e.g., Cheatle and Adair et al.[3] The mechanical supports and tight bandaging commonly employed to mitigate the uncomely appearance and physical discomfort aggravate this tendency to stasis. Ewing [4] assigns to stasis the rôle of principal predisposing cause of cancer in the breast, whilst the experiments of Adair et al.,[3] who artificially induced stagnation of milk in 15 mice, producing thereby metastasing tumours in 13, strengthen the belief that in these extremely large human breasts stasis must cause serious changes in their tissues.

In all the mammæ on which I have operated for hypertrophy of the gland, as distinguished from mere prolapse of a more or less healthy gland, the condition had been present for several years, growing slowly but steadily worse; in all there was definite disease, suspected though not demonstrable before operation, namely "mastitis," "cystic mastitis," or "intracanalicular fibro-adenoma" according to the reports of the pathologist. It appears, therefore. that any operation which does not include removal of the gland will be inadequate.

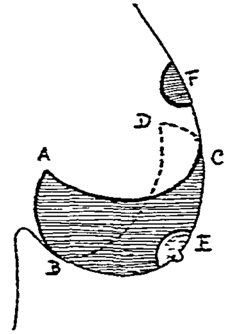
The numerous ingenious operations devised by American and continental surgeons consist, in principle, of a suspension of the corpus mammæ at a higher level. Some diminish the size of the breast by sacrificing part of the fatty capsule, some do not hesitate to take away a discoid or cuneiform portion of the gland itself to achieve an æsthetic result. All agree that preservation of the nipple is essential, all deprecate the complete amputation of the breast in the manner still frequently practised in this country, the results of which are illustrated in my previous paper.[5] So ruthless and summary a method is neither desirable nor necessary. Dartignes claims that operations for æsthetic reasons are essentially French in conception and he coins a curious phrase, the "disgrâce mammaire." He describes four degrees, and his procedure varies accordingly from merely anchoring the gland through a small axillary incision to complete amputation. He considers this last justifiable only for the most severe grades. By the operation which I have evolved the necessity for this latter course can be obviated. Dartignes favours for most cases the operation of Morestin (Fig. 2) which, however, he asserts was first described by Aubert of Marseilles in 1923.

FIG. 2.



Morestin's operation. Case of symptomless enlargement of left mamma in a girl of 17. No disease. S = line of semicircular incision. R = Shaded area representing amount of corpus mammæ removed. A then stitched to A′ B then stitched to B′.

FIG. 3.



Passot's operation. Incisions A C D (upper) and A B D (lower). Then circular incision E around areola and excision of circular area F, removal of skin and subjacent fat in area A B C D (shaded area) freeing of corpus mammæ to allow lifting of nipple into gap F where it is sutured. Note: sometimes he found it necessary to remove the whole corpus mammæ, more usually he excises a discoid portion to reduce the size of the corpus mammæ.

Morestin[6] attempts to preserve the corpus mammæ, but confesses that he has often been compelled to remove a discoid portion (R), sometimes the whole appreciated in the left knee. The right leg still gives a positive Babinski sign, but the ankle-jerks are now easily elicited. Blood picture is Hb. 80 per cent.; red cells, 4,440,000; C.I., 0·9; white cells, 5000. She has again resumed the cooking and housework for the family, and finds no disability from what physical signs she has remaining.

CASE 4.—A nurse, aged 58 years. In May, 1930, began to find difficulty in keeping her balance and doing delicate movements with her fingers. Tingling and pins and needles in her hands. Had to give up work owing to unsteadiness and weakness of the legs. Admitted under Medical Unit in April, 1931. Rombergism was marked, total loss of vibration sense in both legs, and slight weakness of tactile sensation in right leg. Abdominal reflexes lost; bilateral positive Babinski and exaggerated reflexes of legs and arms. Some slight incoördination of arm movements and loss of positional sense in toes. Blood picture showed Hb. 84 per cent.; red cells, 3,600,000; C.I., 1·1; and white cells 9100 with no relative lymphocytosis. Complete achlorhydria present. Cerebrospinal fluid and Wassermann test revealed nothing. Treated with liver and Radiostoleum with some slight improvement. Sent out to nursing-home and from there to rest at home in Suffolk. Here she found that she could only walk with the aid of a stick and had frequent falls.

Written for to return, owing to success of previous cases, and on admission was unable to walk without continually steadying herself by holding on to articles of furniture. Immediately on leaving bed was completely ataxic.

She was treated with Blaud's pill grs. 50 three times a day, and the liver treatment was continued. No massage or any other treatment was given. Very little improvement for three weeks, then a sudden improvement took place. Can now walk round ward and negotiate obstacles placed in her path with very little ataxia, and needs no help at all. Gait still slightly spastic, but otherwise general power of walking is good even on immediately rising from bed. Pins and needles now absent, though these had not been a prominent symptom for some months. Only slight return of vibration sense in left ankle, but good sensation in right leg. Reflexes still exaggerated, but left Babinski is only doubtfully positive. Rombergism now practically absent, and positional sense of toes much better. Patient cannot yet walk up and down stairs without help, but is improving rapidly, while general health is markedly better. Blood count was Hb. 98 per cent.; red cells, 4,930,000; C.I., 1·0; white cells, 8000. Total length of treatment with iron since admission is six weeks.

It will be seen that the clinical improvement in three out of four of these patients was most unusual; in the fourth, who was not markedly ataxic, some improvement occurred in her general power of walking, return of vibration sense and loss of sphincter trouble. In all four cases, only one presented a blood count that resembled pernicious anæmia, but all four had complete achlorhydria. It seems to be essential to continue treatment without remission for at least six weeks before it can be regarded as having failed. All the patients are still taking their large doses of iron at the time of writing, and they will only be reduced when we are certain that maximal improvement has taken place. None of them are experiencing any unpleasant symptoms from the treatment.

From the nature of the pathology of the disease, it is not to be expected that all signs will clear up, for nerve tissue, once destroyed, cannot be regenerated. The chief result must necessarily coincide with the earliest period of the disease, when the morbid changes are essentially those of œdema of the medullary sheaths. It must be due to the fact that there was no actual degeneration of axis cylinders that two out of the four patients who were unable to walk without stumbling are now able to do so, that their ataxia and the other nervous features of their malady are so greatly improved. In all, the sense of well-being and general health is remarkably better.

I have to thank Prof. F. Langmead most sincerely for allowing me to carry out these investigations under his supervision and help. Dr. Wilfred Harris has also seen the cases and has advised a preliminary publication of what has been achieved. It is hoped that this will prompt others to carry out what is essentially an easy treatment, and to report on the results so that its value can be more accurately assessed. In spite of the small number of cases treated, the results appear to warrant the conclusion that the procedure may be a definite contribution to the treatment of a disease which has always provided a difficult therapeutic problem.

SUMMARY.

1. Liver therapy in subacute combined degeneration having generally failed, it was decided to seek for some other factor in its causation.

2. The fact that many cases did not present a typical primary or macrocytic type of anæmia, but rather a secondary or microcytic anæmia combined with an achlorhydria suggested the use of iron.

3. It was decided to give "massive dos[illegible]" because it was thought that iron in large doses [illegible] have been used previous to the introduction of liver therapy.

4. Blaud's pill, grs. 150 a day, was given to four patients with strikingly beneficial results. Two who were not able to walk unaided can now do so, and the other two, in whom the disease was not so advanced, have been greatly improved. No other accessory treatment, except the continuation of liver diet in three cases, has been given.

To simplify administration, Blaud's pill has been made up in powder form in capsules. The dosage is three capsules three times a day, equivalent to grs. 150, given with a little water.

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MASSIVE ENLARGEMENT OF THE BREAST.

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AMONGST the lesser ills that afflict the body enlargement of the mamma beyond the limits o physiological necessity, to such a degree as to embarrass and distress the possessor, presents a problem o interest and of some importance.

Perhaps the condition is less common, perhaps vanit is less of a cardinal virtue in this country; certai it is that little more than a casual consideration seem to have been given to the problem here; and it i necessary to turn to the literature of America, Franc Germany, and Italy to find any serious treatises o the subject. This lack of interest, as reflected in ou literature, probably arises not so much from an rarity of the disease, as from the fact that treatment i usually summary—a sweeping removal of the enlarge organ regardless of all æsthetic considerations, procedure which is adequate but far from ideal.

One variety of excessive development of the breas the hypertrophy of pubescence, not infrequentl arises in sturdy adolescents of agricultural parentag who have been translated to urban surrounding The pathology of the condition remains obscur Beginning at the onset of puberty, though sometim occurring in virgins of more mature age, the diseas affects one or both breasts. Usually the left is th more severely affected. The breast becomes undul enlarged, tense, painful, and sensitive to the lighte touch. Pain is variable in degree; usually it is achin or even throbbing in character. Sometimes the ove

ULCUS TROPICUM,

WITH A REFERENCE TO ITS TREATMENT BY X RAYS.

BY T. R. F. KERBY, M.R.C.S. ENG., D.M.R.E.

lcus tropicum is mentioned as early as 1792 by nter in Jamaica. His description is in general eement with that given in this paper. After 1792 nerous references are to be found, usually iden-ing the ulcers with the part of the world in which observer has seen them. Later it became obvious t the condition was widespread and not localised one particular geographical area. It has numerous onyms but to-day they are seldom used. Among er names are the following: Yemen ulcer, Aden er, Cochin sore, Mozambique ulcer, Sarmes (Congo), l Phagedæna tropica.

The condition is found in all tropical and sub-pical parts of America, Africa, and Asia. It is y much more common in men than in women and ldren. Indeed, to see a tropical ulcer in a woman child is, in my experience, quite rare.

ÆTIOLOGY.

The assertion is repeated in many text-books that us tropicum is frequently a tertiary manifestation syphilis or yaws. With this I do not agree, except so far as it is possible that an untreated tertiary philide might, by superinfection, become a tropical er. In my experience, antisyphilitic measures ve little therapeutic value in tropical ulcer and there ould be little room for error if the Wassermann action is taken in all doubtful cases.

Vincent has found fusiform bacilli and spirilla in ears from these ulcers, and Prowazek, Holbach d Todd attach some ætiological significance to the *irochæta schaudinii* (Prowazek, 1907), a very active otile spirochæte 10-20µ in length with a well-arked undulating membrane and a short flagellum. was suggested that this organism was transmitted a leech but, on inquiry, I can find no evidence sociating the occurrence of tropical ulcer with leech ites in Northern Rhodesia. I regret that no bacterio-gical work on this question has been possible as yet this country. All that can be said from observa-ons here is that in a smear from any tropical ulcer arious micrococci, bacilli, spirochætes, and fusiform acilli have been seen.

The starting point of an ulcer is always, in my xperience, a scratch, wound, or insect bite, and fre-uently one finds a new ulcer arising from the site of n old ulcer previously treated. The assumption, in y opinion, is that secondary infection has super-ened on the primary trauma.

With these local causes it is nearly always found hat the ulcer is in an exposed position—e.g., leg. sually—on a poor adult male with naked legs and eet. In this connexion it is interesting to observe hat the incidence of ulcus tropicum among the native mployees of the Rhodesia railways has decreased normously wherever the wearing of puttees has been nsisted upon. It is usual to find that the patient's esistance is lowered by debilitating diseases such as nkylostomiasis, malaria, scurvy. or filariasis, which are so widespread in tropical Africa.

Tropical ulcer and veld sore are now regarded as two separate conditions. The differential diagnosis can be difficult, and no work has been done in this country on the association of the *B. diphtheriæ* with veld sore. But treatment by antidiphtheritic serum is rapidly successful in a true veld sore and has no effect on a tropical ulcer.[1]

For a paper, followed by a discussion, on attempts to grow the *Spirochæta schaudinii*, with inoculation experiments, those interested are referred to Smith.[2]

Diet and calcium deficiency seem to have a very considerable ætiological significance. The well-fed and well-paid native is rarely found with a tropical ulcer. In my practice all these cases are put on a generous diet immediately on admission; calcium and cod-liver oil are administered daily, and any inter-current disease is treated.

PATHOLOGY.

Unfortunately, no distinctive features have been found on pathological examination. A mass of granulation tissue is seen, usually covered by a fibrinous layer containing detritus and spirochætes and bacteria, together with some eosinophil leucocytes. Only once has a tropical ulcer been proved to be communicable by inoculation. This was done by Lloyd Patterson,[1] who bandaged a swab smeared with discharge from an ulcer on to an abrasion from which the scab had been removed, and succeeded in producing a tropical ulcer. Interesting confirmation of the view that these ulcers are communicable is found in the fact that officials touring from village to village report that in most villages no tropical ulcers are seen and then in one isolated village a series of six or more will be found. My own impression, entirely unconfirmed by any bacteriological or entomological work, is that the infection is, in all probability, carried by flies. If this is so it should be possible, by preventing access of flies to the ulcers, to prevent spread of infection from them to clean wounds in the same ward. In practice I have found this to be the case, and prophylaxis therefore will depend on protection of the skin from abrasions and, when abrasions occur, the immediate application of antiseptic dressings. This is, in substance, the prophylaxis that has been used in this territory for some years now, and if properly applied it is undoubtedly successful.

Healing is apparently never spontaneous, and in any case is always slow and proceeds by granulation from the periphery, leaving a thick white scar which at first is soft and easily broken down, with a consequent renewal of the ulceration.

SYMPTOMS.

At the outset there is a painless swelling which is soft and may be fluctuating. Then a break in the skin is seen from which a serous discharge exudes. This is followed by rapid breaking-down into an ulcer with raised, thickened edges. The ulcers are usually single and rounded but may be multiple. A greyish-yellow, foul-smelling slough now forms and, if no treatment is given, the ulcer rapidly deepens. It may also extend laterally, and there is an occasional tendency to the serpiginous type, but usually the spread is by increase in depth, so that in a remarkably short time muscles and tendons are involved and periostitis develops. This may lead to a diffuse osteitis and osteomyelitis with huge involucra and sequestra, as a result of massive necrosis. Subsequent contractures and deformities are most disabling. On occasion, the untreated case progresses to septicæmia and death.

VARIOUS METHODS OF TREATMENT.

It is a remarkable fact that very little space is devoted in the standard works on tropical medicine gland, to obtain a satisfactory result. This procedure is dictated solely by the necessity to reduce the bulk of the mass, and not from any conviction that the gland is diseased and therefore superfluous. Raymond Passot [7] (Fig. 3) similarly preserves the gland wherever possible, but sometimes has to remove a discoid slice from the base of the gland to lessen the bulk. The plan of this operation is ingenious, and good æsthetic results are claimed for it. Dowkontt[8] (Fig. 4) leaves the corpus mammæ intact. After removal of a circular strip of skin and subjacent fat, he suspends the gland at a higher level by suturing the upper and outer rim to the aponeurosis covering the pectoral muscles and then unites the skin edges. Again the æsthetic results appear to be admirable, but a scar is left over the upper part of the breast at its junction with the chest wall. Moreover, this operation does not seem adequate for any but the milder grades of the affection, and could scarcely be applicable to those cases in which the weight of the corpus mammæ itself is from 2 to 4 lbs.

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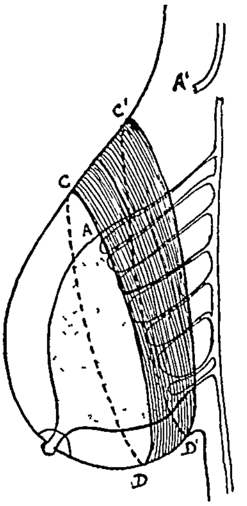
[1] Manson-Bahr, P.: Manson's Tropical Diseases, 1925.

[2] Smith, E. C.: Proc. Roy. Soc. Med. (Sect. Trop. Dis.), 1930, xxiv., 1.

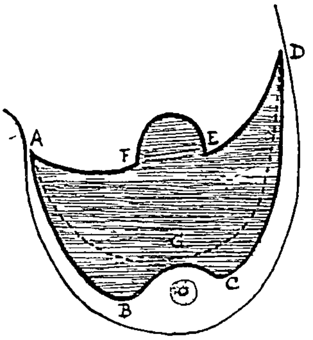
If my contention be true that in all these cases where intervention is justifiable the organ is hopelessly diseased and useless for lactation, it is necessary to make removal of the gland itself an essential part of the operation. Accepting this as axiomatic, I devised and have employed the following operation in which the corpus mammæ is removed, the fatty envelope and the nipple are preserved, and by which the æsthetic requirements are satisfied.

FIG. 4.



Dowkontt's operation. By circular incisions C D : C' D', removal of skin and fatty envelope between C C' and D D', then stitching the upper margin of the corpus mammæ A to the lip of aponeurosis A raised from the chest wall by a transverse incision, and finally suture of skin edges C to C' and D to D'.

FIG. 5.



H. H. Greenwood's operation. Removal of skin over shaded area A B C D E F, incision of fatty envelope along line A G D, removal of corpus mammæ, and suture of skin edges B to F, C to E.

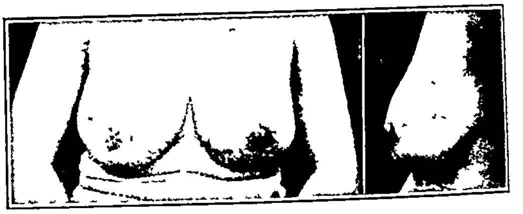
OPERATION.

In the following operation (Fig. 5), as in all those referred to above, preservation of the areola and nipple is regarded as imperative.

The operation is begun by lightly scratching on the skin a line from the nipple situated at the lower pole, upwards to the point at which it is decided that the transplanted nipple shall lie. Two curved incisions A B C D and A F E D are then made through the skin only. The lower one sweeps upwards slightly in a low curve above the areola ; in the upper curved incision a semilunar segment F E is excised, to receive later the portion B C ; the intervening portion of skin is then dissected off and removed. The fatty capsule is then incised down to the gland along the line A G D, placed nearer to the lower incision to safeguard the nutrition of the lower flap. By keeping close to the surface of the corpus mammæ the two flaps of the fatty covering can be dissected in a continuous layer back as far as the margin of the gland all round ; the bundle of lactiferous ducts, after being isolated, is severed cleanly as near as possible to their junction with the gland.

The flaps are enveloped in large moist swabs whilst the whole of the corpus mammæ is being removed ; all bleeding points are carefully secured, and a small drain leading from the cavity is inserted through a stab puncture at the most dependent point of the reconstructed breast, and left for 24 to 48 hours. The fatty capsule is now drawn together by a few fine catgut sutures, being so disposed as to reproduce as nearly as possible the contour of the normal organ. The skin edges are united by fine fishing-gut sutures or by Michel's clips. Abundant dressings and moderately firm bandaging limit effusion and add greatly to the comfort of the patient.

FIG. 6. FIG. 7.



Photographs from same case as Fig. 1. Result of second operation.

The photographs (Figs. 1, 6, and 7) are from a patient, aged 37 years, nulliparous, in whom the slowly increasing weight and painfulness of the breasts had become an intolerable burden. The first operation was done on the right breast (Fig. 1) on March 1st, 1931, that on the left side seven weeks later. The immediate result is shown in Figs 6 and 7, which indicate the substantial diminution effected in size. The latter can be regulated according to the physique of the patient. In this case the cosmetic result improved later still more, but as the patient came from a distance a more recent photograph is not available.

In the published reports of the various methods hitherto employed little comment is made on the subsequent condition of the breast as regards pain, the cosmetic result being emphasised. The five breasts on which I have operated were markedly tender and painful, and there was strong presumption of disease in the corpus mammæ, so that any operation which left the gland seemed likely to fail in an important respect. The operation I have described removes the painful diseased gland, without inflicting an irreparable deformity on a sensitive patient.

We recognise readily enough the distress caused to patients by facial blemishes or disfiguring varicose veins, and make haste to remedy these with all the skill at our command. We are apt to overlook the sensitiveness, very real though less frequently avowed, of a patient who has undergone an unnecessarily mutilating operation on the breast.

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6. Morestin, M. H. : Bull. et Mém. Soc. Chir. Paris, 1909, xxxv, 996.
7. Passot, Raymond : Presse Méd., 1925, xxxiii., 317.
8. Dowkontt, C. F. : Med. Jour. and Rec., 1929, cxxx., 624.

OPENING OF FALKIRK INFIRMARY.—Prince George last week formally opened the new infirmary at Falkirk which has been erected at a cost of £100,000. With the exception of the maternity home and a portion of the isolation block, which are being paid for by the local authorities, the whole of the cost has been raised by voluntary subscriptions. A considerable proportion of the total has been provided by working people, who gave twopence and threepence a week for two or three years.

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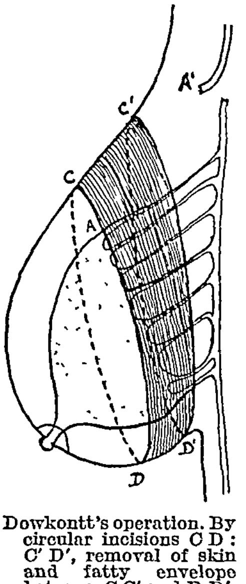

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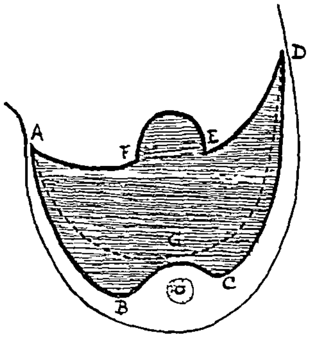

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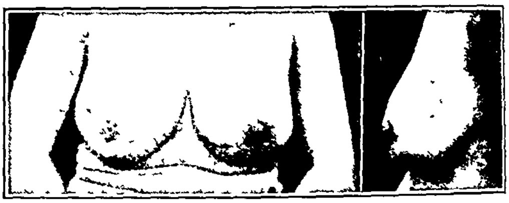

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in saline was the only dressing applied. As I have mentioned previously, all necrotic tissue was first curetted away under general anæsthesia before the course was begun.

ZINC IONISATION.

Twenty-five cases were treated by this method. I have found it particularly useful in healing up residual areas of ulceration which, though clean and apparently healthy, refuse to granulate up and epithelialise. I have been unable to satisfy myself that this method has any great practical value in treating the large tropical ulcers ab initio, and on the whole I am inclined now to reserve ionisation for the occasional treatment of small residual indolent patches of a partially healed ulcer. For ionisation a 1 per cent. solution of zinc sulphate has been used and the current intensity has been at the rate of 2 m.a. to the square inch for 20–30 minutes.

The type of case chosen for X ray therapy was the chronic indolent type which had existed for some time or had resisted other methods of treatment. My reason for this choice was that I find that when a case comes up early it is comparatively easy to heal the ulcer by the method I have outlined, and consequently there seemed to be no necessity to use an expensive (and not always available) method of treatment. The results of X ray therapy are, in my opinion, distinctly disappointing. I have been quite unable to satisfy myself that any appreciable improvement was caused by X radiation, and the eventual healing of the ulcers treated by this method was, I think, due to the preliminary curettage and the daily cleansing of the ulcers.

Method.	Ulcers treated.	Average duration before beginning treatment (patient's statement).	Average number of days before healing was complete.	Healed.	Unhealed.
X ray therapy "A."	25	4 months	98 days	20	2 absconded. 1 died. 1 handed over to surgeon. 1 still in hosp.
X ray therapy "B."	26	4½ months	99 days	21	1 died. 4 still in hosp.
Zinc ionisation.	25	As this treatment was usually employed in conjunction with, or after, other forms of treatment, no figures can be given.			
"Bipp."	25	1 month	31 days	25	nil.
Peroxide, fomentations: eusol dressings.	25	3 weeks	51 days	24	1 absconded.

METHOD OF TREATING ULCUS TROPICUM WITHOUT PRELIMINARY CURETTAGE.

As many cases of this condition occur in native districts and are attended at dispensaries which are only occasionally visited by a medical officer, I have tried to work out a method of treatment which can be carried out with more or less success by the African orderly in charge of the dispensary. A method that has been reasonably satisfactory in the case of recent ulcers has been to give the ulcer a preliminary thorough swabbing with hydrogen peroxide (and here the orderly needs a heavy hand if the method is to be effective) followed by boric fomentations and then eusol or other dressings. This method is, however, quite unsuitable for the chronic ulcer and, in my opinion, these cases should be sent immediately to the nearest station at which there is a medical officer. A record of results of cases treated is given in the Table.

CONCLUSIONS.

1. *Prophylaxis* depends upon: (*a*) Adequate nutrition and freedom from debilitating disease. (*b*) Protection of exposed parts from trauma (e.g., labourers should wear puttees and shoes). (*c*) Prompt application of antiseptic dressings to all minor injuries. (*d*) Early application for treatment when an ulcer begins to develop. (*c*) (*c*) and (*d*) involve the provision of trained medical orderlies at dispensaries, or in villages, who will supply dressings and educate the native mind. All gangs of labourers should have a medical orderly attached to them.

Of one thing I am convinced, and that is that these ulcers should almost never occur in natives employed by Europeans. A very small amount of supervision should suffice almost entirely to prevent the occurrence of ulcus tropicum in industrial areas.

2. *Treatment.*—I favour the following routine treatment:

(*a*) As soon as possible after admission, the blood, urine, and fæces are examined and a routine physical examination of the patient is made. Treatment is begun at once for any pathological condition discovered in the examinations, and the patient is put on a liberal mixed diet with as much fruit and fresh vegetables as possible. If no other drug is found necessary (to treat intercurrent disease), calcium lactate and cod-liver oil are prescribed. The patient remains in bed, and the bowels are kept well open.

(*b*) Under general anæsthesia the ulcer is curetted with a blunt curette and the undermined and indurated edges are clipped away with scissors. All pockets are well opened and, if necessary, the bone is scraped and sometimes the medullary cavity will require to be opened.

(*c*) Bipp is now packed into the ulcer, lint applied, the limb firmly bandaged, and the patient returned to bed. The number of times Bipp is repeated is a matter for the discretion of the medical attendant in the individual case. It rarely needs repeating after five or six days.

(*d*) Wet eusol dressings are then applied twice daily until the ulcer is healthy and clean and a fine ingrowth of new skin begins to appear.

(*c*) Zinc oxide strapping is then applied so that an area of one inch around the ulcer is included. This is left in situ for a week, at the end of which time it is removed, the ulcer is cleaned up with eusol, and the strapping is reapplied. About this time the patient is usually allowed to get up and stroll about the grounds. In some cases he is now allowed to come up as an out-patient.

In conclusion, I have to express my thanks to Dr. P. H. Ward, Director of Medical and Sanitary Services in this territory, for permission to carry out this work in the Native Hospital, Livingstone. I have also to thank the staff, both European and native, of this hospital for their assistance. I must also apologise for the lack of references and express my indebtedness to the authors of Manson's "Tropical Diseases," Byam and Archibald's "Practice of Medicine in the Tropics," and Castellani and Chalmers' "Manual of Tropical Medicine."

Livingstone, Northern Rhodesia.

Durham County Hospital.—The scheme of reorganisation proposed by Dr. Charles Franks, the county medical officer of health, proposes the reduction of the number of isolation hospitals from 28 with 700 beds to 12 with 582 beds, and that there should be three small-pox hospitals instead of ten. Dr. Franks found that in 1930 the beds were occupied on only 138 days. The reduced beds would thus still leave a sufficiently large margin to deal with any moderate epidemic. Extensions of the remaining hospitals could be made economically.

to this disabling condition. This can, I think, only be explained on the supposition that no really satisfactory treatment has yet been evolved, and no specific treatment is possible owing to the general doubt regarding ætiology. It is for this reason that, as suggested in Manson's "Tropical Diseases," I decided to try the effect of X ray therapy. Before discussing a series of cases treated by radiotherapy I propose to outline the more generally used methods of treatment.

An essential preliminary to any form of treatment is to cleanse the surface of the ulcer. This may be done either by using powerful caustics, such as pure carbolic acid, or by curettage. Personally I prefer curettage under local or general anæsthesia, and I regard it as essential to remove all sloughing and unhealthy tissue and also to cut away with scissors the undermined and overhanging edges. All my cases are treated in this way and, in my view, it is useless to hope to heal one of these ulcers unless a thorough preparation of this kind is first undertaken.

Another feature which must be common to all forms of treatment is the elimination of any intercurrent affection of the type mentioned under ætiology. With this goes the natural corollary that a generous mixed diet with an abundance of green vegetables and fresh fruit must be ensured.

The only drug I use now is calcium in conjunction with cod-liver oil, for I consider that deficiency in lime salts is a marked feature in the natives of some parts of this territory. I have not found that opium has the specific effect on the phagedænic process that is claimed for it. Nor does iodide of potash seem to make any considerable difference.

Local Treatments.—A multitude of lotions and ointments have been used by numerous people. The object of all is the same—viz., to stimulate the callous and slowly healing tissues to greater activity and more rapid healing. The most popular in the textbooks is 1/1000 perchloride of mercury lotion followed by 5–20 per cent. protargol ointment or 8 per cent. scarlet-red ointment. In the Congo Belge good results are claimed for a powder containing iodoform 2 parts, calcium chloride 20 parts, sodium bicarbonate 78 parts. I have not found this remarkably successful, though it has occasionally been useful. Wet eusol dressings, saline, zinc sulphate, and other lotions have been used. Of the dyes, I have tried methyl violet, brilliant green, and acriflavine. Here again some measure of success can be claimed but results are not consistent. A powder containing zinc oxide and iodoform is popular, and certainly produces a fair number of good results, but, after trying all the remedies already mentioned, I have no hesitation in saying that easily my best results were obtained by a thorough curettage with the application of "bipp." Following this procedure the ulcer is treated on general surgical principles by eusol or other dressings.

Skin Grafts.—When there is a large area to granulate up, skin grafts are of the greatest value in hastening healing, but two not inconsiderable difficulties have to be met. One is the attitude of the native patient who objects to having a new "chilonda" (i.e., ulcer) made, as he thinks, to obtain the skin for grafting, and the other is the great difficulty in preserving asepsis once the grafting has been done.

Antivirus.—Six cases have been treated ab initio by staphylococcus antivirus which was kindly supplied to me by Glaxo Laboratories for the purpose. Unfortunately my work in the Native Hospital was interrupted at this point, but there is no doubt in my mind of the remarkably good effect the antivirus had in cleaning up an ulcer which had received no other treatment. I am definitely of opinion that this line of treatment is well worth extended trial.

Vaccine Therapy.—Investigations are in progress in Salisbury, Southern Rhodesia, with a view to the production of a specific vaccine. The Director of Veterinary Research informs me that so far no "stock" vaccine has been evolved and, as no facilities exist here for the making of vaccines from swabs, I have been unable to investigate this line of treatment

Strapping.—When the ulcer is clean and healin from the edges, firm strapping with zinc oxid strapping is definitely useful. I have had no oppor tunity of trying elastoplast bandages on these cases But as the question of expense is of paramoun importance, I have abandoned my original scheme o firm strapping of the whole circumference of the lim and now employ a piece of strapping which overlap the healing edge of the ulcer by one inch. I find tha this may safely be left in position for a week. Whe it is removed there is always a certain amount discharge but, provided that the preliminary curetta has been thorough and no necrotic material has bee left behind, it will be found that surprising progre in healing has been made. I think that the adva tage of strapping lies in the fact that the edges of t ulcer are approximated and the delicate epitheli cells are protected from injury.

General.—I have come to the definite conclusi that isolation of these cases in so-called "tropi ulcer wards" is not necessary and, in fact, is to deprecated. I now admit them to the general surgi ward, where their beds may be alongside a "clea hernia or gastro-enterostomy case, and the orderl are trained to exercise the usual care while doi dressings and are told that transference of infecti should never occur. So far I have not had any case infection of a clean wound from a tropical ulcer in t ward. This result is, in a large measure, due to t fact that the sister personally supervises eve dressing; and here I wish to emphasise a point whi I regard as of the utmost importance—namely, th good as African orderlies can be and often are, t best results are only obtained by rigid supervision all their work by the medical officer or sister on du If dressings are left to the orderlies without sup vision I find that a definite increase in the length stay in hospital results.

I regard rest in bed as important in the early sta and allow the patient to walk about only when heal has definitely begun and the ulcer has been strapp

X RAY AND ELECTRICAL THERAPY.

I have searched in vain for any references previous work on the treatment of ulcus tropicum X radiation. The librarian at the Royal Society Medicine has been unable to help me, after a k and careful search. I have therefore based my tre ment on suggestions kindly given me by Dr. J. H. Webster and Dr. A. E. Barclay. Two lines of tre ment have been tried, each in a series of 25 cases.

Method A.—First treatment: 5 H. at 80 k.v. unfilter 23 cm. F.s.d.; 3 m.a. Area irradiated includes a ma of about 1 cm. of skin around ulcer. Ten days late series of five weekly doses of 2 H. at 100 k.v.; 23 F.s.d.; 3 m.a.; 0·5 mm. Al. filter.

Method B.—The only difference lies in the fact that in method I have omitted the first unfiltered dose and gi a series of six doses at seven-day intervals of 2 H. at 100 k 23 cm. F.s.d.; 3 m.a.; 0·5 mm Al.; again including the area irradiated a margin of the skin around the ul

During the course of X ray treatment the ulc were swabbed daily with saline, and plain lint soal but it was not painful. nor was there fluctuation. The knees and ankles were normal. Radiography of the right wrist showed no bony change. The wrist was aspirated and 3 c.cm. of purulent synovial fluid were withdrawn. There was a purulent vulvovaginitis. and vaginal swabs were taken. In both the vaginal smear and the joint fluid gonococci and many pus cells were present. Blood culture was negative.

Both wrist-joints were immobilised, and gonococcal vaccine in doses ranging from 2½ millions to 75 millions were given at weekly intervals. The vulvovaginitis was treated by Protargol packs and daily douching with chloramine T. solution. No further aspiration of the wrist-joint was necessary. But for a temporary increase in swelling of the left wrist on the fourth and fifth days the inflammation in the joints subsided rapidly, so that they were normal in appearance and function in a fortnight. The vaginal discharge ceased. and within three months repeated vaginal smears were negative to gonococci.

We have to thank Mr. E. I. Lloyd and Dr. Nabarro for permission to publish this note.

TWO CASES OF UTERUS DIDELPHYS.

By G. S. WOODMAN, M.B. DURH., F.R.C.S. EDIN.,

SENIOR SURGEON, ROYAL HOSPITAL, BAGDAD; CHIEF SURGICAL SPECIALIST, IRAQ.

THE following are two unusual examples of uterus didelphys :—

CASE 1. *Complete uterus didelphys with double vagina.*—A woman, aged 20, married six years, was admitted to the Royal Hospital. Bagdad, on April 4th, 1931, complaining of sterility. Apart from scanty three-day menses recurring every 20–25 days, there was nothing of note in the history. and she was a well-developed young woman with normal secondary sexual characteristics. Per vaginam. above a small cervix, a shade larger than the tip of my second finger, there was no central body but on either side and apparently attached to it, a small pear-shaped mass, and lateral to these easily palpable ovaries. No visual vaginal examination was made. At operation on May 4th (intrathecal percaine) two mobile "half" uteri. widely separated above were found to be fused just above the cervix. Each was about 2½ in. long and had in the normal site a patent tube and normal ovary. A slice was removed from the medial surface of each down to a point where both cavities met and the remaining musculature of each half sutured together without difficulty or tension. Ten days later a probe introduced into the cervix readily reached the new fundus. On withdrawing the speculum. I noticed an aperture. ¼ in. in diameter. to the right of the vagina. Digital exploration demonstrated that this was the narrowed ostium of a right-sided vagina. of considerably smaller bore than the left. from which it was separated by a stout septum the upper end of which intervened between two cervices. both completely circular. Probes passed into each met in the middle line immediately above them.

It is evident that the paring of the two halves prior to their suture was not carried low enough to disclose the presence of the right-sided cervix. which had not. but should have been discovered before operation.

CASE 2. *Removal of the left half of a uterus didelphys seven months after labour in the right half.*—A patient, aged 30, was admitted to the Royal Hospital. Bagdad. on Nov. 17th, 1931. complaining of pain in the left hypogastrium of seven months' duration. Married 13 years. her first pregnancy had terminated seven months before admission. in the birth at the eighth month of a girl who died on the twelfth day. A stormy puerperium. with fever. left-sided pain and vaginal discharge had kept her in bed for three months. For the ensuing four months she had had severe attacks of fever with increased pain. but no discharge. Her periods both before and after pregnancy were irregular. coming on every 10–15 days and lasting 4–6 days. Abdominal examination showed only marked tenderness in the left hypogastrium. Bimanually the cervix was normal in size and position, the uterus large with marked deviation to the right, and the right ovary palpable. On the left side there was a hard tender mass about the size of a tangerine orange.

The abdomen was opened under intrathecal percaine on Nov. 21st. To the large uterus lying well to the right side was attached at the normal site a healthy right ovary and patent tube. There was no evidence of a left tube or ovary. Low down on the left a somewhat pear-shaped mass. its upper end firmly bound to the rectum and Douglas's pouch by dense adhesions and its lower end apparently fixed to the upper part of the cervix was dissected out as far as its neck, on division of which a thick. chocolate-coloured. slightly foul-smelling fluid escaped from small openings in both cut surfaces. The remaining lower portion of the mass was densely adherent in its upper part to the cervix medially and in the base of its inferior expanded portion to the vaginal wall. On removal it consisted of a smooth thick-walled sac—the walls being twice as thick where they enclosed a small opening superiorly. It contained a similar fluid. On superimposition and section of the two parts of the mass, it was seen to comprise a uterus and cervix measuring 2½ in. and a vagina 1¼ in. long. Dissection on its left side revealed an ovary and tube densely matted to the uterus and to each other. The patient made a normal recovery and was discharged on Dec. 6th.

It is difficult to reconstruct the sequence of events in Case 2 which undoubtedly represents a condition of uterus didelphys. It seems more reasonable to suppose from the presence of the pent-up menstrual fluid that the puerperal inflammatory attack had resulted in the closure of a previously existing intervaginal orifice, of which there was no trace in the right vagina, than that the menses had regularly escaped into the abdomen till the tube was closed by the inflammatory process. Whatever the explanation it is remarkable that the right uterus and its appendages suffered so little from the inflammation as compared with the left, presumably due to better natural drainage.

It may be of interest to record that apart from the patient in Case 2, who was a Muslim, all my patients with gross malformation of uterus and vagina have been Nestorian Christians (Assyrians). The latest is that of a case of uterus bicornis whose abdomen I explored on August 10th, 1931, suspecting an ectopic gestation. I found, instead, a pregnancy in the right horn and on Dec. 4th she was delivered of female twins. The explanation of the greater incidence amongst Christians is, I think, to be found in their greater willingness to submit to examination and not to any degeneracy of the Assyrians who, although since 1917 they can hardly be described as a tribal community, are a strong virile race with no signs of excessive interbreeding.

I wish to thank the Inspector-General of Health Services in Iraq for permission to publish this note.

LYMINGTON COTTAGE HOSPITAL.—Extensions and improvements of this hospital have just been completed. A new wing has been added containing six private wards and the necessary accompaniments. and. with money left by the late Mr. Barklie Henry and given by his family, an operating theatre. X ray and massage departments have been provided.

NORTH STAFFORDSHIRE RADIUM CENTRE.—The North Staffordshire Royal Infirmary has been recognised as a regional radium centre, with the use of £5000 worth of radium. A deficit of £947 on the year's working of the hospital brings up the accumulated deficit to £9684. The total cost of each in-patient last year was £9 12*s.* 7*d.*, a decrease of £1 3*s.* 0½*d.*, and the average cost per head per day was 9*s.* 5*d.*, a decrease of 8½*d.* In-patients numbered 5445. a decrease of 203. owing to the temporary closing of several wards for modernisation and redecoration. Out-patients numbered 27,206. a large decrease. At £53,654 the ordinary income fell by £3938; the extraordinary income (mainly legacies) fell by over £5000 to a little over £4000.

CLINICAL AND LABORATORY NOTES

A CASE OF RECURRING SPONTANEOUS PNEUMOTHORAX

WITH ACUTE PRESSURE SYMPTOMS.

By H. Selby, M.B., B.S.Lond.,
MEDICAL SUPERINTENDENT, CREATON SANATORIUM, NORTHAMPTON.

In spontaneous pneumothorax due to tuberculosis the air gains entrance to the pleural space through a breach in the visceral pleura following the breaking down of a subpleural focus. The rupture may be small and rapidly closed by the resultant retraction of the lung; or large and remain patent; or it may be valvular. In the first case, intrathoracic pressure will be little changed; in the second, free communication will exist between the air in the bronchi and that in the pleura so that pressure will be atmospheric and the degree of collapse variable; in the third case, an increasing positive pressure will result with maximal collapse and its results. Introduction into the pleura of contaminated air and products of the causative disease is usually followed by the formation of fluid or pus. If distress is severe, relief is obtained by inserting a needle through the chest wall and allowing some of the air to escape. The following case showed a combination of unusual features.

A. B., aged 21. No family history of tuberculosis. Complained of cough and lassitude 18 months previously, but continued at work until very slight hæmoptysis occurred six months ago when the sputum was examined and found to contain tubercle bacilli. He was ordered to stay in bed, and shortly afterwards developed a spontaneous left pneumothorax with apparent complete collapse of the lung and great displacement of the heart. He remained in bed for six months, and was admitted into this sanatorium on June 18th, 1930. On admission his condition was moderate, temperature 97°–99° F., pulse-rate 90–110, signs of active tuberculosis in both lungs, left lung fully re-expanded, heart normal in position.

On July 29th, 1930, he suddenly became collapsed, complaining of pain in the left chest and difficulty of breathing. Spontaneous pneumothorax was diagnosed. During that night his condition becoming gradually worse a pneumothorax needle was introduced, a small positive pressure was found, and complete relief was obtained by letting out some air. Next morning the dyspnœa increased and the pulse became feeble; a needle was again inserted, 1400 c.cm. of air being allowed slowly to escape, the final mean pressure being reduced to atmospheric. During the next few hours his condition steadily deteriorated, dyspnœa was urgent, pulse bad, cyanosis considerable, and the impulse of the heart could be felt only in the right axilla. The needle was reintroduced and connected by a tube to a bottle of weak antiseptic at the bedside. On this occasion the pressure was too high to be read on the water manometer. The urgent symptoms soon passed off and the patient remained comfortable, the latter half of each inspiratory act being accompanied by a stream of bubbles into the bottle.

On each subsequent day, tests were made to see whether compensation had been established, by partial or complete clamping of the tube leading from the needle, and eventually while the patient was asleep; but on each occasion, and also on two occasions when the needle became blocked by serum, the attempt resulted in the return of alarming symptoms. On the ninth day partial clamping of the tube could be tolerated with the assistance of narcotics, and on the tenth day the needle was removed, cyanosis still being marked, temperature 100° F., pulse-rate 130–140, respiration 40–48. Re-expansion of the lung was slow, X ray showing complete collapse with the heart still on the right side of the sternum four weeks later, and collapse of the upper half of the lung and some mediastinal displacement eight weeks later.

The history of the first attack of left spontaneous pneumothorax was confirmed by the patient's own doctor, Dr. Mary C. Elliot, who noted complete collapse of the lung with great displacement of the heart. Some adhesions may of course have been present on each occasion and have been ruptured by the high pressure, but no evidence of this was present on the second occasion and none of the usual after-effects occurred. This contrasts with the usual experience in treatment by artificial pneumothorax, so often cut short by the development of obliterative pleurisy, and it would have been expected that during the course of slow re-expansion after the first attack some adhesions would have formed. It may be that repeated punctures, variations in intrapleural pressure, and prolonged collapse of the lung predispose to pleural thickening and subsequent adhesions; cases, however, have been described in which collapse has been obtained several months after an artificial pneumothorax had been allowed to re-expand.

No exudation into the pleural cavity was diagnosed *on the first occasion, and none was formed* on the second occasion in spite of presumably severe contamination from the lung and irritation by the presence of a needle for many days. The rupture through the visceral pleura would appear to have been of a valvular nature in view of the persistently increasing intrapleural pressure, and it is likely that compensation occurred when the rupture became fully patent rather than when it healed or was closed by compression. As usual in a tuberculous pneumothorax there was no precipitating factor causing rise in intrapulmonary pressure on either occasion. Both attacks occurred while the patient was at rest in bed.

SUPPURATIVE GONOCOCCAL ARTHRITIS IN A CHILD.

By James Crooks, M.B. Edin., F.R.C.S. Eng.,
SURGICAL REGISTRAR, THE HOSPITAL FOR SICK CHILDREN, GREAT ORMOND-STREET, LONDON;

AND

A. Gordon Signy, M.R.C.S. Eng.,
CLINICAL ASSISTANT IN THE VENEREAL DISEASES DEPARTMENT OF THE HOSPITAL.

This case seems worthy of record in view of the rarity of gonococcal suppuration in joints as a complication of vulvo-vaginitis in children. It is the only example of this condition that has been seen in an experience of over 15 years and 250 cases of vulvo-vaginitis, at the Hospital for Sick Children. David Lees[1] also reports that "in 200 cases of vulvo-vaginitis no cases of arthritis had occurred, although some American workers give figures as high as 40–50 per cent."

A girl, aged 4½ years, came to the Hospital complaining of swelling and pain of the right wrist-joint for 10 days. The mother stated that both knees, the left wrist, and the right ankle had been similarly but less severely inflamed during the last three weeks; they had subsided without treatment. For one month there had been a vaginal discharge.

The child looked ill, but the temperature and pulse were normal. The right wrist was red, swollen, hot, and tender, and movement was exquisitely painful. The swelling, which was fluctuant, was most marked on the dorsum of the wrist. The left wrist was slightly swollen, and its movements were limited, pressure was "that pressure due to contraction of the arteries under which the red and white cells of the blood can thrive and function to the best advantage." That defined also the basic pressure; there was additional pressure at each heart-beat, and the two combined to constitute the systolic pressure. An increased basic blood pressure interfered with the oxygen-carrying capacity of the red cells, for it modified their surface tension. On the other hand, such a poison as lead in the blood caused a more powerful contraction of arteries—i.e., it raised the basic pressure. He suggested that in diffuse hyperplastic sclerosis the activity of the endothelial cells represented a struggle on the part of those cells to obtain the supply of oxygen which the raised basic pressure interfered with.

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[1] Lees, D.: The Lancet, 1931, i., 640.

Dr. F. Parkes Weber expressed his belief that, for practical purposes, there was no essential—i.e., primary—hypertension, any more than there was an essential hypertrophy of the heart. In cases of permanent hypertension with an average systolic pressure up to 200 mm. of mercury he thought the condition almost always represented a conservative compensatory or life-prolonging reaction to some cause, either known or unknown. When one heard of some noted person having lived a very long time in spite of his having a very high blood pressure, which had resisted all attempts to permanently lower it, what had probably happened was that he had lived so long in spite of some condition which had been more or less compensated by his high pressure. Indeed, it might be this continued high pressure which had prolonged his useful life, and had his heart not been able to maintain this pressure he would probably have died in middle age. In such cases he thought everything pointed to the high pressure being secondary and compensatory. Prolonged bodily and mental rest tended to lower the blood pressure temporarily. Apart from renal disease, he thought the cause of hypertension in many cases was the arterio-sclerosis which Dr. Evans years ago claimed to be the anatomical manifestation of hyperpiesia. Often, he thought, permanent hypertension represented a special type of reaction to the stress of life.

THE TOXIC CAUSE.

Dr. H. Batty Shaw said that in his view hyperpiesia was of chemical origin. If one was not content with an occasional reading of blood pressure, but took it each night and morning for weeks and months, it would be found to fall periodically to 60 or 70 mm., and a day or two later return to the former height. That fact was a complete answer to those who still maintained that hyperpiesis was no more or less than a reaction to occlusive disease of arteries or arterioles. If the latter view were correct, why did pressure fall without any direct treatment? Also, having fallen so deeply, why did it return to its former level? To him the answer was clear: that the malady was a biochemical one, and that therefore one would look in vain at the bedside for the ætiology; one must go to the chemist for the solution. The former idea that this sustained high pressure was due to a disorder of the suprarenal gland was now generally regarded as exploded. Dr. Evans stated that arterio-sclerosis was an intermediate product, and that it was responsible for the hypertension, but in laying stress on intimal proliferation of vessels and fatty degeneration he thought that Dr. Evans was asking too much of his theory. The speaker was not aware of toxins being produced by fatty degeneration or other changes in the walls of vessels except those due directly to bacteria there. The white patches and retinitis in association with hyperpiesia he considered were due to rupture of the small vessels there, the bursting having been due not primarily to the hyperpiesis or the toxins, but to the patient having been infected, this infection being responsible for the damaged state of the capillaries.

Sir John Broadbent said that before the distinction was made between hyperpiesis and renal disease it was thought that the sustained high blood pressure was due to deficient elimination of nitrogenous bodies by the kidneys. That idea was done away with because many cases of high pressure had no renal disease. Efforts to find free iodine in the blood of these patients were not successful. He thought most would now agree that the cause was some toxin. Starling, it was true, discovered that anæmia of the vasomotor centre would cause prolonged high blood pressure, but no disease was known in which that centre was specially anæmic. High blood pressure could not continue without increased peripheral resistance; there must be some cause acting on the arterioles as well as on the vasomotor centre. The toxin responsible might not necessarily be a bacterial one. Many people were needlessly frightened by being told they had high blood pressure, and they sought drugs to bring it down; it was far better to put them to bed and keep them on a low diet.

Mr. Eardley Holland said that the gynæcologist was sometimes confronted with women who had hyperpiesis in pregnancy, and were advised to terminate their pregnancy, and, he thought, rightly. Occasionally he had cases which illustrated climacteric causes of high pressure; he did not know why, but variations of blood pressure were very common at the climacteric period. It was a time of failure of hormones. He was interested in the possibility of uterine hæmorrhage occurring in association with high blood pressure. He had long refused to believe that high blood pressure could cause the menstrual periods to increase in duration or in quantity.

Prof. Frederick Langmead said he understood that the importance of the suprarenal glands in this connexion was now considered to be overrated, and that opinion was veering round to the pressor substances, to toxins—derived from it was not clear where. No one with much experience of autopsies could deny that patients dying with high blood pressure and cerebral hæmorrhage or heart failure often showed considerable hyperplasia of the suprarenal bodies. Where should this factor be placed in the ætiology?

Dr. Izod Bennett thought that not all renal consequences could be ruled out in a discussion of this sort. Renal ischæmia must be included as one of the three great menaces to life caused by hypertension. Much instruction could be drawn from the group of cases in South Australia, where there were many cases of chronic hypertension and renal failure in young persons, which had been traced to lead poisoning. Dr. Bennett alluded to the value of venesection in hyperpiesia.

Dr. H. Letheby Tidy said that in every case where a patient was known to have died of permanent essential hypertension a change in the nature of an intimal hypertrophy had been found—that change which Dr. Evans described as diffuse hyperplastic sclerosis. After studying the history of the famous Bristol family one could not doubt the hereditary nature of prolonged high blood pressure associated with intimal hypertrophy. Sydenham

MEDICAL SOCIETIES

MEDICAL SOCIETY OF LONDON.

A MEETING of this society on Jan. 25th, with Mr. HERBERT TILLEY, the President, in the chair, was devoted to a discussion on the causation and treatment of

Essential Hypertension.

Dr. GEOFFREY EVANS said that despite many debates the subject was still controversial and indefinite. The term "essential hypertension" was differently used by different people, and he intended to limit it to a condition in which the blood pressure was 170 mm. Hg systolic, or more, and 90 mm. diastolic, or more, over a period of several days at least, with the patient at rest. In these cases there was often some evidence of hypertrophy of the left ventricle and an accentuation of the aortic second sound, which was not obvious in transitory or paroxysmal hypertension arising from emotion, fatigue, or other cause. Cases of persistent hypertension due to renal disease must of course be ruled out from the "essential" group, and also cases in which the rise of blood pressure was symptomatic—whether of retroperitoneal tumour, alcoholic excess, lead poisoning, circulatory failure, infection, or endocrine disturbance.

In essential hypertension there was often a hereditary factor. Thus one patient whose condition was diagnosed at the age of 12 as arterio-sclerosis, and who subsequently avoided over-fatigue, alcohol, and tobacco had a blood pressure of 176/116 at the age of 50. On inquiry it was found that his father died of organic heart disease at 60, his father's two parents of cerebral hæmorrhage when a little over 70, his two sisters of cerebral hæmorrhage at 48 and 60. The patient's mother was alive and well, but her mother died of organic morbus cordis. A striking characteristic of people with essential hypertension was their heavy build, with short thick neck, the females being more of the acromegalic type; the connexion between a heavy build, and obesity, diabetes, and persistent hypertension was well recognised. Some insurance statistics made out that half the cases of hypertension were persons over average weight, and the causes of their deaths were apoplexy, heart disease, and nephritis, in that order. The effect of treatment confirmed this observation, for in some cases reduction of weight was accompanied by reduction of blood pressure. T. S. P. Strangeways had believed that gout was associated with hyperpiesia—a condition from which nephritis was excluded —and had pointed out the association of osteoarthritis with arterio-sclerosis. Dr. Evans did not know whether these were ætiological factors, but perhaps things responsible for one condition might also be held responsible for the other.

FUNCTIONAL AND STRUCTURAL PATHOLOGY.

The profession was still left in doubt about the nature and causation of essential hypertension. One could approach the pathology from two points of view—that of function and that of structure. Functionally it was due to increased resistance in the peripheral systemic circulation. The hypertension was maintained by increased activity of the heart and of the vessels which had to maintain the higher tension. With this increased tension, the reservoir part of the arterial system—the aorta and the largest of the arteries—was stretched, and this stretching resulted in a loss of elasticity, so that pressure was further increased; hence, necessarily, the systolic pressure must increase out of proportion to the diastolic. What determined this persistent hypertension? Was it disturbance of central or peripheral control? Harvey, Cushing, and Starling had shown that anæmia of the bulbar centre caused hypertension, an outflow of vaso-constrictor impulses, in particular to the arterioles, and a rise in systemic pressure. Dr. Evans had looked for an explanation of bulbar anæmia in terms of disease of small vessels supplying the medulla, but without success. There might be chemical changes not yet recognised; or there might be simply an inherited instability of the vasomotor centre; or possibly toxins acted on it.

Could any help be obtained from the morbid anatomy? There was, first, a physiological response to over-function—i.e., proliferation of the media and some thickening of the intima of the vessels. There was also fatty degeneration and obliteration of lumen in the arterioles, and the same in the parent vessels, but without fatty degeneration; and the latter change occurred in some organs only. It took place in the spleen and kidneys to a great extent, also in the suprarenals, the medulla, the pancreas, and to a less extent in stomach and intestines, not in the heart or skeletal muscles. He imagined there was a pathological agent producing both structural and functional change. The nature of this change might throw light on its cause. He did not agree that it was due to arterial hypertrophy. The condition existing had been termed a diffuse hyperplastic sclerosis or arteriolo-sclerosis, which was better than the term arterio-capillary fibrosis, for the change was not fibrotic but proliferative. The lesion might be inflammatory, but if so, one should be looking for chemical toxins rather than emotional strain as a cause. Anderson and Keith had shown that in persistent hypertension there was a thickening of the internal elastic lamina and proliferation of the lining endothelial cells, sometimes accompanied by proliferation of the sub-endothelial tissues, and these changes pointed to some chemical stimulus causing inflammatory reaction.

There was no special treatment for hypertension, and many a person had hypertension without suffering from it; in this respect it was like the fibrosis resulting from healed tubercle. It was necessary to discover whether the hypertension in the particular patient was a symptom of active disease, and whether he was actually suffering from his high tension. If so, it was he who needed treatment and not the hypertension.

Dr. G. ARBOUR STEPHENS said that blood-pressure readings were seldom taken in children, but in view of Dr. Evans's differentiation he thought it would be necessary in future to take the blood pressure of patients of all ages, so as to be able to say whether a rise was temporary or permanent, and how long it persisted in various forms of disease. The pressure depended on the quantity of the blood, its quality, the degree of contraction of the arteries, and the force of the ventricular contraction. The purpose of the circulation was to convey oxygen from the lungs, in which the oxygen tension was about 100 mm. Hg to the tissues, where it was only 20 to 40 mm. This transfer could only be effected if the blood was under suitable pressure. His own description of normal blood n this respect. In hot climates the terrestrial radiation was a great factor, and the amount of heat falling on a body there was double that due to the sun alone. And the atmosphere was responsible for a considerable amount of radiation, because of the contained aqueous vapour. Dry oxygen and nitrogen mixed would have no effect. Emanations of terrestrial radiation were absorbed independently of colour. There was considerable chemical action in short wavelengths and every series had a different effect. Because of the layer of ozone in the upper atmosphere there was very little ultra-violet light in solar radiation.

Atmospheric electricity was invoked to explain almost all the unknowns on this subject. If electricity was going to have any effect on the body it could only be through the electrical field, or free electricity, or through radio-activity. There was always a big electrical field in the atmosphere, so big, indeed, that the difference in potential between the head and the feet when walking in the street was 300 volts, a power sufficient to light a lamp. In a thunderstorm one was subjected to an electrical field of something like 100,000 volts between the head and the toes. There was no physiological effect, however, because we were surrounded by an almost perfect non-conductor, the air. The only exception was when rupture occurred in lightning. We were surrounded by a certain amount of free electricity in the form of electrically charged molecules; it had been computed, however, that there was only one charged molecule in a thousand million million neutral molecules.

Dr. Simpson said in conclusion that he had measured radio-activity in all parts of the world, and he found it so infinitesimal that it could have no effect on health.

DISCUSSION.

Dr. J. KINGSTON BARTON exhibited a graph, showing thermometric and barometric variations during December and the first week in January, and simultaneous variations in death-rates from cerebral hæmorrhage, respiratory diseases other than tuberculosis, and old age. With moderate exceptions there was a coincident rise in the death-rate of all these conditions during the period of abnormal temperature for the season of the year.

Dr. R. KING BROWN said he believed that more iodine was obtained by dwellers at the seaside than those inland, probably because of the decomposition of seaweed. Certainly goitre was uncommon in seaside dwellers. In the view of Sir Leonard Hill, the katathermometer showed the bracing quality of seaside air, but his researches had not yet found their due place in the books. He found that in Victoria (Australia) because of the dryness of the air and the amount of wind, high temperatures could be endured without discomfort.

Dr. C. W. BUCKLEY said he had noted for a long time that cases of rheumatic fibrositis, even those kept in bed or in close stuffy rooms, were very much worse while high winds prevailed, especially (at Buxton) winds from the north-west. They were also in a poor condition just before rain, but much better during rain. Often empiricism came by its own in the long run.

Dr. H. S. STANNUS declared that in the tropics he was able to feel when a thunderstorm was approaching. In the ordinary course he felt very active and could walk many miles, but when a storm was approaching he felt listless and unwilling to do anything.

Dr. W. CRAMER remarked that one of the trying features of the weather in this country was the climatic change from day to day. Climatic conditions stimulated the sympathetic system, the system particularly concerned with heat-regulation and the thyroid and adrenal glands. The results of these influences would naturally be manifested psychologically; in fever the sympathetic system was a defensive mechanism.

Dr. SIMPSON replied.

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE.

ON Jan. 21st at the first meeting of this society to be held in its new premises, Manson House, 26, Portland-place, Dr. C. M. WENYON gave an address on the

Transmission of Leishmaniasis.

He pointed out that since the announcement of Knowles, Napier and Smith in 1924 that the parasite of Indian kala-azar underwent a definite development in the sand-fly *Phlebotomus argentipes* intensive researches had been carried out in India, North China, Sicily, and other places with the object of obtaining evidence that these insects are responsible for the spread of the disease. Similarly since the brothers Sergent, Parrot, Donatien and Béguet, in 1921, had produced oriental sore in man by inoculation of the skin with an emulsion of sand-flies collected at Biskra in Algeria, and Adler and Theodor in 1925 had obtained a like result in Palestine when they inoculated into the skin of a human volunteer flagellates which they had discovered in a *P. papatasii* caught in Jericho, investigations had been concerned very largely with this sand-fly and allied species. In spite of all these investigations, Dr. Wenyon said, in only two or three instances is there evidence that kala-azar and oriental sore have been transmitted experimentally by the bite of a sand-fly. This relative failure has tended towards a revival of older theories and the introduction of new ones, but none of these satisfies requirements.

Leonard Rogers, in 1904, proved that the Leishman-Donovan body was a flagellate of the leptomonas type, and as organisms of this nature are essentially parasites of insects and some other invertebrates and never occur in the free-living condition any theory of transmission of leishmaniasis must take into account the flagellate stage. The Leishman-Donovan body will develop into a leptomonas only in blood media. It will not survive in water or other blood-free fluids, it cannot withstand drying, and quickly dies except in blood media in a culture tube or in the intestine of blood-sucking insects. A typical leptomonas is that of the flea, which lives in the hind-gut and passes from flea to flea directly by means of rounded leishmania forms voided in the flea's dejecta. Such a leptomonas in its natural host displays three important features. First the ingestion by the insect of very few rounded forms leads to heavy infections; secondly, the flagellates attach themselves to the intestinal wall; and thirdly, the infection once established persists for the remainder of the life of the host. Though it has been demonstrated that Leishman-Donovan bodies may escape in the fæces of kala-azar cases suffering from dysentery and even in the urine, that monkeys and other animals may be infected by feeding them with infected tissues, and that occasionally healthy animals will contract infection when kept for months in had declared that to him all manifestations of disease, however harmful, were evidences of a protective reaction on the part of the organism. At present it was impossible to say which came first, intimal hypertrophy or hypertension. When the condition became advanced there was always arteriolo-sclerosis present.

Dr. BERNARD SCHLESINGER referred to a group of cases which had a periodic syndrome consisting of migraine, cyclical vomiting, vaso-vagal attacks, and vertigo. In a number of these cases there was a definite hyperpiesia. But, in contrast to the cases under discussion, in remedying the syndrome the blood pressure tended to fall. The idea was that they had some peripheral vasomotor contraction, and hyperpiesia existed as a temporary compensating phenomenon.

ROYAL SOCIETY OF MEDICINE.

SECTION OF PHYSICAL MEDICINE.

AT the first meeting of this newly constituted section, held on Jan. 15th, with Dr. F. G. THOMSON, the President, in the chair, a paper on the

Meteorological Factors which may Affect Health

was read by Mr. C. G. SIMPSON, D.Sc., Director of the Meteorological Office. He said that whatever might be the opinion of medical men on the interaction between the weather and personal health, the ideas of the man-in-the-street were very hazy, and he would approach the subject from the latter's standpoint. Ordinary people had heard of such factors as *atmospheric electricity, ozone, radioactivity,* and ultra-violet light, and there was a tendency to ascribe to all and each of them happenings which seemed otherwise obscure. The inquirer should be on his guard concerning this tendency to explain the unfamiliar by the familiar. It was the common custom to pick out coincidences and attribute to them the exaggerated importance of cause and effect. In all such inquiries it was necessary to have the mathematical coefficient, and records must be made at regular intervals, and, if possible, by independent observers. It had always been the custom to associate bad smells with illness, pleasant odours with good health, and this became a danger when the carrying of flowers and perfume boxes was a recognised method of keeping away infection. In assessing the influence of weather on health it was important to separate the physical effect from the psychological. People believed it was unhealthy to sit in a room with closed windows, that the shutting of the windows deprived the contained air of some of its virtue; but in most rooms in this country enough air exchange was effected to obviate any ill-effects. The depression felt by people sitting in a closed room was, Dr. Simpson contended, chiefly psychological. And the ordinary barometric pressure changes could have no detrimental effect on health; certainly they were too gradual for this to happen. An ascent to high altitudes rapidly in an aeroplane, or the quick descent into a coal-mine was a different proposition largely because of the different proportion of oxygen present in the air.

Temperature changes were important, but largely because we objected to the discomfort of feeling very cold or very hot. It was astonishing what changes in temperature the body would tolerate without ill-effects, always providing the air was calm. One night while he was in the Antartic regions he was called out of bed to look at a display of the aurora Clad only lightly he went outside and remained there over an hour with the temperature at 90° (frost, without coming to any harm. It was a ver calm night, so that the loss of heat from the bod was at the minimum for the temperature. In suc intense cold, however, one would be unable to wal quickly or run, for the intake of air produced acu pain in the throat and bronchi.

With regard to humidity, the air breathed o contained water up to saturation point for t temperature; in the air inspired the proportı of water vapour varied with the weather conditior If the air was very dry, breathing produced a gradual increasing thirst, owing to the drainage of water fro the system. This was the explanation of the gre thirst experienced by Polar explorers, which w easily remedied by taking in a certain quantity snow. The higher the relative humidity of t air, the less the evaporation from the body. It w not true to say that when the air was very humid the was no evaporation taking place from the bod because—in this country at least—the body w always warmer than the surrounding air. I determining the degree of unhealthiness of a clim he commended the wet-bulb thermometer. Wh in India, it was estimated that the wet-bulb thern meter would rise to 80°, telegrams were sent to t different cantonments concerned, and exercises a all extra work by the troops were stopped or curtail

In Dr. Simpson's view, the only important influe which weather had on the body was its extraction heat from the body; and when the quantity extracted was reasonable, the sensation was one stimulation. The invigorating effect felt on pass from a closed room into a brisk wind was not due a different composition of the air in the two places, l to the air in motion extracting heat from the bc rapidly. The question had been many times discus as to why two seaside towns on the same coast sho bear a different reputation. The difference wo usually be found to be solely due to the more brac town having its promenade right on the sea-fro with nothing to obstruct the wind, while the oth not far away, was largely protected from the la ward winds, either by the conformation of the land because the beach for visitors was some dista back. The merits of seaside places could not ascribed to ozone; Lord Rayleigh had declared t the quantity in the air was so minute that e the most delicate instruments scarcely recor any; it was declared to be 3 mg. to 100 kg. of and that was equalled by many industrial towns

Fogs were generally supposed to be unhealt but if a fog was clean he did not see why it should be breathed without detriment, for the composit of the air was then no different. It might, course, have a depressing mental effect. Dirty f were an entirely different matter, for the pollut conveyed to the air was held in suspension by it, a was breathed into the lungs. People put do wonderful things to radiation, but he sugges that there were only three ways in which it co affect the human body: thermally, chemically, a psychologically. Whether they were long wa as in wireless reception, or short waves, like those ultra-violet light, their characteristic was that w absorbed they produced heat. Visible rays w absorbed by different bodies according to their colo a black body absorbed all the visible rays, a white b reflected all, while other colours were intermedi esent. Whatever may be the explanation the idence to incriminate the sand-fly is so overwhelming, id Dr. Wenyon, that investigations may be continued ith confidence that ultimately the missing factor ill be discovered and the sand-fly theory of transission of kala-azar and oriental sore will receive mplete justification.

CHELSEA CLINICAL SOCIETY.

Dr. H. Rivers Pollock, the President, took the hair at a meeting of this society held on Jan. 19th t the Hotel Rembrandt, and Mr. Guy C. Pollock Managing Editor of the *Morning Post*) opened a discussion on

Medicine and the Press.

He complained that, while the medical profession claimed to abhor advertisement, it advertised in many ways, such as the exhibition of plates, the compilation of lists of names and qualifications, and the publication of bulletins on the health of celebrities. He felt that the position was ridiculous. The journalist who wanted to publish medical information acceptable to his public must have a signed article; he might induce a big man to defy the General Medical Council, but if he could not, then he had to have his article written by a layman under the guise of "A Harley-street Specialist," or by an insignificant medical man who thought the risk worth taking in order to curry favour with the public. The public was always extremely interested in its health and wanted to know about new diseases and about really serious things like epidemics; it ought to have access to the opinions of properly qualified persons whose worth it could judge from their signatures. The public much preferred the signature of a nonentity to no signature at all. For this reason no newspaper liked the idea of receiving its news from a committee of experts, as suggested by some reformers; moreover, it did not want matter which was being distributed to competitors. He claimed for the *Morning Post* and for Mr. Gwynne, its editor, some recognition of the courage shown in being the first to deal frankly, at the request of the leaders of the medical profession, with the problems of venereal disease.

Sir Squire Sprigge (Editor of *The Lancet*) first dealt shortly with articles on public medicine—the administration of the health laws, the management of public medical institutions, vital statistics and similar matters—for which he held that no signature was required, as all the facts could be verified. Indeed, many of such articles could properly be signed. Though articles of this kind were often written in a dull way, there was no reason why they should not be made readable, and their potential educative value was very great. He then admitted that the public wanted the "story" of the general treatment and of the new medical discovery, and to have this story signed, preferably by an eminent authority, but in default by anybody. The General Medical Council had made no rule against signing articles but had expressed a strong adverse opinion in certain directions. and had done so for two reasons: first, no individual view on treatment was worth anything as a general guide; and secondly, the doctor who signed an article on treatment knew for that reason that his views were untrustworthy. The medical profession therefore felt that such a man was certainly pretentious and in all probability would attract to himself the patients of other doctors; he wronged the profession and the public alike. Moreover, he inspired false hopes in the untreated and caused disappointment to those who had been treated in other ways, thus sapping the confidence of the public in the profession.

The speaker suggested tentatively that newspapers might find it very useful to provide themselves with medical "advisers," as distinguished from correspondents. An adviser might never write a word, but would give the editor informed and intimate criticism of medical articles. The leaders of the profession would be perfectly willing to coöperate in this way, provided that they were not hurried. The trouble was that, no matter how important a subject might be, speed of publication was regarded as the first essential, and questions concerning medical matters could not be satisfactorily answered without time and care. Nevertheless, if only editors could arrange for an answer to the simple questions: "Is this old? new? sound? probable? informed? disinterested?" half their difficulties would be over. If medical information were put on that basis of serious responsibility, signatures would not be required; the articles would be signed by the prestige of the paper.

DISCUSSION.

Mr. Philip Page, a colleague at one time of Mr. Pollock, held that journalism being already overrun with blacklegs, it was a most blessed thing that Harley-street was content to save humanity and to refrain from teaching humanity on paper.

Dr. Ernest Young deplored the practice of some editors of communicating the names of anonymous and pretentious medical authors to persons who wrote asking for them. In this way a writer might gain far more illegitimate advantage from an unsigned than from a signed article.

Mr. Ivor Back agreed with all the views of Mr. Pollock. None of his audience, he said, would linger over unsigned articles entitled "Is there a God?" or "Is Death by Hanging Instantaneous?" but if those articles were signed respectively by Dean Inge or Mr. Pierpoint, they would be read with enthusiasm. Moreover, if articles were signed, the public would soon find out which authors were valuable and which were worthless.

Dr. Scott Stevenson (Editor of the *Practitioner*) denied that articles would not be read unless they were signed. He was more interested in the leading articles of *The Lancet* than in the original signed communications. In his early days he had contributed many articles on medicine to the lay press, although he had never signed one; if an article could not get in on its own merits, it would not get in whatever name were appended to it. The good newspaper article was one that was readable and topical.

Dr. K. Eckenstein said that most medical articles in the public press consisted of medical "discoveries," and that the great thing from the journalistic point of view was news.

Dr. C. F. Beevor expressed weariness with pseudo-advertising, and advocated the establishment of a committee to be responsible, in all but the leading newspapers, for medical articles and the bulletins of celebrities.

Mr. Herbert Tilley inquired where, if Mr. Pollock once admitted the signing of articles, he would draw the limiting line for that form of advertising. At present there was one law for the G.P.

close intimacy with infected animals, this contaminative method of infection directly from man to man can hardly occur on a large scale in nature. The organism is not sufficiently resistant, while the flagellate stage is unaccounted for. Again, though the Leishman-Donovan body will develop into a flagellate in the stomach of the bed-bug and will survive for as long as five or six weeks, there is no active multiplication while the three conditions mentioned above are not fulfilled. Moreover there is no correlation between the distribution of kala-azar and oriental sore and bed-bugs. It seems clear that the stomach of the bed-bug is acting merely as an imperfect culture tube and that the development of the Leishman-Donovan body is an abortive one.

The flea at one time was suspect but attempts at transmission by this insect as also with the bed-bug have failed entirely. Similar experiments with other blood-sucking invertebrates have shown that though the parasites may survive in the intestine for some time no development occurs. The sand-fly alone appears to answer all requirements except that of actual experimental transmission. Both kala-azar and oriental sore occur only in districts where these insects are found, though there are places where sand-flies abound in which these diseases are unknown. Nevertheless certain species in their distribution correspond closely with the endemic centres. Thus in India *P. argentipes* is closely associated with kala-azar, and this is true of *P. major* var. *chinensis* and *P. perniciosus* in the North China and the Mediterranean regions respectively. In the case of oriental sore *P. papatasii* and *P. sergenti* can similarly be suspected. If these sand-flies are fed on cases of the diseases in man or experimental animals the parasites ingested undergo a remarkable change. There is a rapid development of the flagellate stage followed by active multiplication till the whole of the midgut is a seething mass of organisms which in the neighbourhood of the proventriculus are attached to the epithelial lining. The infection spreads forwards along the œsophagus to the pharynx and even into the proboscis itself. A condition is produced like that seen in plague-infected fleas in which these regions of the alimentary tract are blocked with plague bacilli. It has been demonstrated by Adler and Theodor that if infected sand-flies are allowed to feed through a membrane on sterile fluid, flagellates can be found in the fluid afterwards, a fact which proves conclusively that flagellates are discharged from the proboscis during the feeding act. Furthermore, it has been demonstrated that the flagellates in the sand-flies are virulent and will produce oriental sore or kala-azar if injected into experimental animals. It is almost impossible to suppose that the whole of this remarkable development is accidental and has no bearing on the ætiology of the diseases.

The complete development as described above does not occur in all sand-flies. There is evidence that for each locality there is the right sand-fly and the right strain of parasite. In India it is the local strain of *Leishmania donovani* and *Phlebotomus argentipes*, in North China the Chinese *L. donovani* and *P. major* var. *chinensis*, in Sicily and Malta *L. infantum* and *P. perniciosus*, in Palestine *L. tropica* and *P. papatasii*, and in Bagdad *L. tropica* and *P. sergenti*. The local strains will develop to some extent in other sand-flies but less completely and with a lower rate of infections. Under favourable conditions when there is opportunity for every sand-fly fed to take up parasites the infection-rate in the species mentioned may approach 100 per cent. This occurs in cases of kala-azar in dogs or experimental hamsters when there is a heavy infection of the skin with *L. donovani* ensuring that every sand-fly has ingested parasites. Apart from the evidence supplied by experiments with the human strains of leishmania certain work with leishmania infections of lizards is very suggestive. Geckos, on which certain species of sand-fly feed almost exclusively, are liable to harbour parasites allied to those of kala-azar and oriental sore. It has been shown in certain cases that the sand-flies become infected by feeding on the geckos but the development occurs in the hind-gut and not in the anterior part of the alimentary canal. It is highly probable that the geckos acquire their infection by devouring infected sand-flies. These observations again indicate a specific relationship between sand-flies and the vertebrate parasites of the leptomonas type.

Though from the data given above it would seem that there was every reason to suppose that sand-flies were the vectors of kala-azar and oriental sore, the final proof of experimental transmission by the bite has been more difficult of realisation than was expected. In the various centres where investigations have been carried on, thousands of infected sand-flies have been fed on human beings or susceptible animals such as the hamster without infection occurring. The extent of the work is well illustrated by the figures given in 1928 by Shortt, head of the Kala-Azar Commission in Assam. In all 273,467 sand-flies have been bred in the laboratory and of these 79,939 were actually fed. Of sand-flies, a large proportion of which were known to be infected, 3590 were fed on white mice, 2325 on the Chinese hamster, and 1247 on human volunteers. Similar though smaller figures appear from the records of work at other centres. In spite of this, experimental transmission was not effected. Nevertheless the work was still continued with the result that from Assam has recently come the report of the successful infection of one hamster by the bite of *P. argentipes*. On this animal there were fed during the course of 17 months 12 dozen *P. argentipes*, the majority of which must have been infected. Previously Adler and Theodor in Palestine had fed on the arm of a volunteer a number of *P. papatasii* infected with *Leishmania tropica*. As in six months no infection had appeared the volunteer was inoculated on the other arm for another purpose. Some months later lesions appeared at the exact spot on which the sand-flies had originally fed, and in these parasites were demonstrated. The man had lived in a part of Jerusalem where imported cases of oriental sore occurred, so that there was a possibility of his acquiring infection there. Nevertheless the appearance of lesions at the actual spot on which the sand-flies had fed is very suggestive that experimental transmission had been effected. Chodukin and his assistants working in Taschkent report that they have transmitted oriental sore from dog to dog. A dog with oriental sore was placed in a fly-proof cage and kept at one end while at the other end were four healthy puppies. Sand-flies were constantly introduced during three months. Two months later one of the puppies was found to have oriental sore. These are the only instances in which there is any possibility that kala-azar and oriental sore have been transmitted by the bite of the sand-fly. It seems evident that there is some missing factor. Knowles has suggested that in Bengal there may be wholesale inoculation of the population and that kala-azar only results when this factor, which may be a depression due to typhoid fever or malaria, is

REVIEWS AND NOTICES OF BOOKS

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This book should be in the possession of every practitioner. It will prove a valuable friend, and if he remembers that percentages and statistics represent average findings and not any individual case he will not be betrayed by his reliance on the cumulative experience here recorded.

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Matas Birthday Volume.

A Collection of Surgical Essays written in honour of Rudolph Matas, New Orleans. New York: Paul B. Hoeber Inc. 1931. Pp. 396. $10.00.

A SERIES of surgical essays has been published in honour of the seventieth birthday of Rudolph Matas by a group of his friends and former pupils. The first contribution is an admirable account by Dr. Mont R. Reid, of Cincinnati, of a group of cases of vascular lesions illustrating some of the principles taught by Prof. Matas. He describes the remarkable recovery of a bedridden invalid following the extirpation of a femoral arterio-venous aneurysm. This patient had been regarded as suffering from cirrhosis of the liver, and his ascites had been controlled by frequent paracentesis. Dr. Reid's paper is followed by a report on cases of Raynaud's disease and thrombo-angiitis obliterans of the upper limbs treated by ramisection by Prof. Alessandri, of Rome. The section on vascular surgery, to which Matas has made so many brilliant contributions, is completed by a paper on personal experiences in vascular surgery by Dr. Hubert A. Royster. Dr. Bloodgood, of Baltimore, contributes a biographical sketch of the late Prof. Halsted, entitled "Halsted Thirty-six Years Ago," while Dr. J. M. T. Finney and Dr. J. M. T. Finney, jun., describe a case of hypertrophic tuberculosis of the ileum, to which they append a full bibliography. Dr. Robert C. Coffey, of Portland, supplies a well-illustrated article on cancer of the rectum, which is quite outstanding in a galaxy of admirable essays. In it he describes his modification of the abdomino-perineal operation and gives statistics of his own cases. Dr. E. Ribas y Ribas, of Barcelona, reports a case of intestinal obstruction due to an obscure developmental anomaly in which the whole of the small intestine was removed, the patient surviving for six months. In an interesting study of cancer in the North American negro, Dr. Frederick L. Hoffman shows that the cancer death-rate has shown a persistent rise during the last thirty years, and now tends to approximate to that of the white population. J. Shelton Horsley and John B. Deaver write on cancer of the stomach and breast respectively, and Dr. George W. Crile contributes one of his typically stimulating articles on anæsthesia. Articles on rhinoplasty by Dr. Paul Moure, of Paris, on fistulas following hydatid cysts by Dr. Trias Pujol, of Barcelona, and on the place of the senses in the development of science by Dr. W. J. Mayo follow. Prof. D. P. D. Wilkie is the sole British contributor with an essay on splenectomy, and it would be hard to better his description of the operation, which is very and another for the J.P.: the hard-working general practitioner in a country village who wrote an article in the local press on his own observations on influenza would be attacked by all his colleagues, but a medical knight who wrote an article for the *Times* was handsomely rewarded. If a medical man could sign an article, why could he not have his name on a tin of patent food?

Mr. FRANK COKE remarked that, whereas workers in the large laboratories who made discoveries had an immediate entrée to the lay press, an obscure, lonely worker who made a discovery could only describe it in a medical paper and might fail to gain a hearing even there. The lay press was the only medium by which the news of a discovery reached the patient. All discoveries needed commercial interests to develop them; the obscure man who attempted to develop his discovery commercially was at once accused of selfishness or of having a secret remedy. The speaker advocated the establishment of a board for the purpose of furthering discoveries by obscure workers.

REPLIES.

Mr. POLLOCK retorted to Mr. Tilley that the thin end of the wedge had already been inserted in the shape of pseudo-advertising. He wished to draw no line; the G.M.C., the B.M.A., and many other influences were sufficient to keep advertising within reasonable bounds. He suggested that Dr. Stevenson's unsigned articles had been contributed some years ago and that he would not be so fortunate nowadays. He reiterated that an unsigned article had no commercial value. He brushed aside any idea of a "Lausanne Conference" in the shape of a board or committee, and emphasised the essentially ephemeral nature of newspaper articles.

Sir SQUIRE SPRIGGE agreed that the idea of a board or committee was futile. He assured Mr. Coke that the lonely, obscure research worker was a phantasm. Medical discoveries were almost without exception the result of previous work, founded on work previous to that; the fruit of a long series of triumphs and failures. By the time a real discovery was made, about ten persons could lay reasonable claim to having had something to do with it. He doubted whether, by bidding the unknown and lonely discoverer to go away, any injustice had ever been done.

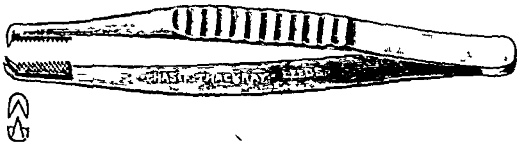
COLSTON RESEARCH SOCIETY, BRISTOL.

This society was founded over 30 years ago, as the University College Colston Society, to assist the Bristol University College financially, and to foster the idea of a University of Bristol. When at the end of ten years the University came into existence the society decided to devote itself to the encouragement of research in the University. A collection is made each year among the citizens of Bristol by the president, who is elected for one year only, and many thousands of pounds have been raised and used for this purpose. In the last few years the collection has averaged about £800. In 1931 Mr. Falk, the president, received a special gift of £5000 from eight donors for research in medicine, and it has been decided to apply the income of this fund to the provision of one or more Colston Medical Research Fellowships of not less than £100 per annum each, which shall be awarded by the Council of the society. They are intended primarily for clinical work, though other medical subjects are not excluded, and they will be open to any member of the medical profession in Bristol, preference being given to graduates or members of the teaching staff of the University. The work must be carried out in the University itself, or in one of the clinical institutions associated with it, and the Fellowships will be renewable yearly at discretion. Applications should reach the hon. secretary of the society, 12, Small-street, Bristol, on or before April 30th of each year.

NEW INVENTIONS

COMBINED TOOTHED DISSECTING AND SUTURE-HOLDING FORCEPS.

THE forceps here illustrated is designed for use as an ordinary toothed dissecting forceps, as well as for holding and keeping suture material taut during a continuous stitch, and in tying knots. The suture material may be readily grasped and held firmly between the evenly approximating surfaces without damage.

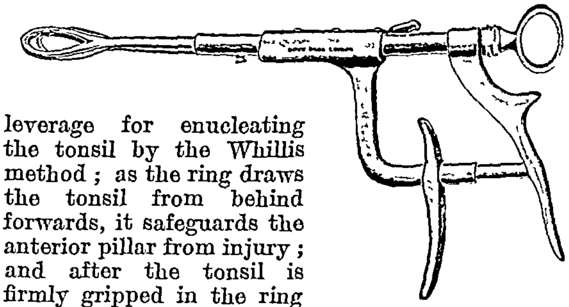


The instrument has been made for me by Chas. F. Thackray, Regent-street, London, W.

LANCELOT BROMLEY, M.Ch., F.R.C.S.

A MODIFIED FAHNESTOCK TONSIL ÉCRASEUR.

I HAVE been using a modification of Fahnestock's tonsil écraseur which has a double handle, thus affording a squeezing action. The advantages of this instrument (here illustrated) are: it gives good leverage for enucleating the tonsil by the Whillis method; as the ring draws the tonsil from behind forwards, it safeguards the anterior pillar from injury; and after the tonsil is firmly gripped in the ring by squeezing the handle, the process is continued by bringing the screw into action. By slowly rotating the ring the base of the tonsil is strangled and separated; if five minutes are allowed for each tonsil, the separation is practically bloodless and causes a minimum amount of trauma. The drawbacks are that the instrument is not suitable for rapid tonsillectomy with ethyl chloride; and it requires a prominent tonsil. For a flat tonsil, I prefer the Jenkin's guillotine.



Messrs. Down Bros., St. Thomas's-street, London, S.E., have carried out my design of this instrument.

T. B. JOBSON, M.D.

INFLUENZA IN A HOSPITAL.—Owing to influenza among the staff, Barnet Cottage Hospital, Herts, has had to refuse new patients. Seventeen inmates have been removed elsewhere; the 13 that remain cannot safely be removed. One of the maids has died, and it is reported that the matron, the sister-in-charge, two probationer nurses, two ward-maids, and another maid are ill.

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Matas Birthday Volume.

A Collection of Surgical Essays written in honour of Rudolph Matas, New Orleans. New York: Paul B. Hoeber Inc. 1931. Pp. 396. $10.00.

A series of surgical essays has been published in honour of the seventieth birthday of Rudolph Matas by a group of his friends and former pupils. The first contribution is an admirable account by Dr. Mont R. Reid, of Cincinnati, of a group of cases of vascular lesions illustrating some of the principles taught by Prof. Matas. He describes the remarkable recovery of a bedridden invalid following the extirpation of a femoral arterio-venous aneurysm. This patient had been regarded as suffering from cirrhosis of the liver, and his ascites had been controlled by frequent paracentesis. Dr. Reid's paper is followed by a report on cases of Raynaud's disease and thrombo-angiitis obliterans of the upper limbs treated by ramisection by Prof. Alessandri, of Rome. The section on vascular surgery, to which Matas has made so many brilliant contributions, is completed by a paper on personal experiences in vascular surgery by Dr. Hubert A. Royster. Dr. Bloodgood, of Baltimore, contributes a biographical sketch of the late Prof. Halsted, entitled "Halsted Thirty-six Years Ago," while Dr. J. M. T. Finney and Dr. J. M. T. Finney, jun., describe a case of hypertrophic tuberculosis of the ileum, to which they append a full bibliography. Dr. Robert C. Coffey, of Portland, supplies a well-illustrated article on cancer of the rectum, which is quite outstanding in a galaxy of admirable essays. In it he describes his modification of the abdomino-perineal operation and gives statistics of his own cases. Dr. E. Ribas y Ribas, of Barcelona, reports a case of intestinal obstruction due to an obscure developmental anomaly in which the whole of the small intestine was removed, the patient surviving for six months. In an interesting study of cancer in the North American negro, Dr. Frederick L. Hoffman shows that the cancer death-rate has shown a persistent rise during the last thirty years, and now tends to approximate to that of the white population. J. Shelton Horsley and John B. Deaver write on cancer of the stomach and breast respectively, and Dr. George W. Crile contributes one of his typically stimulating articles on anæsthesia. Articles on rhinoplasty by Dr. Paul Moure, of Paris, on fistulas following hydatid cysts by Dr. Trias Pujol, of Barcelona, and on the place of the senses in the development of science by Dr. W. J. Mayo follow. Prof. D. P. D. Wilkie is the sole British contributor with an essay on splenectomy, and it would be hard to better his description of the operation, which is very well illustrated, and his accounts of treated cases. The last essay in the book is by Dr. Howard Lilienthal on the Operative Treatment of Phthisis, in which he makes a powerful plea to surgeons not to withhold their help from the desperate case, illustrating his thesis with ten case reports. The plea is particularly appropriate in this book, because for many years past advanced cases of vascular disease have been referred to Matas from all over America, and very seldom has he refused to intervene. Though no exponent of that form of heroic surgery which is manifested by dramatic scenes in the operating theatre, Matas has always been prepared to fight with death not only during an operation but for long hours afterwards at the bedside, and even in desperate cases his skill has sometimes been victorious. The final contribution to the volume is a note by Dr. Evarts A. Graham on the reaction of bronchial fistulæ to acute respiratory infections.

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The Causation of Chronic Gastro-duodenal Ulcers.

By J. JACQUES SPIRA, M.R.C.S.Eng., L.R.C.P.Lond. London: Humphrey Milford, Oxford University Press. 1931. Pp. 78. 7*s.* 6*d.*

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We feel that no good can come of a more detailed review of this book, which we have examined with great care. It may fairly be described as a well-written thesis quite unworthy of general acceptance until such time as its author is prepared to abandon the collection of literature, and to perform a few crucial experiments by which alone the value of his theory can be tested.

Journal of Pathology and Bacteriology.

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Obituary notices of R. M. Buchanan (portrait), A. S. Warthin (portrait), W. E. Dixon, J. S. C. Douglas (portrait).

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[*See also pp.* 24 & 25.]

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THE LANCET.

NDON: SATURDAY, JANUARY 30, 1932.

BRONCHOSCOPY.

UCH water has flowed under the bridges since OLINI, in 1875, first made a direct examination he trachea and larger bronchi by means of a e passed through a tracheotomy wound. For years or more after VOLTOLINI's experiments ious isolated attempts were made to examine trachea and bronchi directly, the chief being t of KIRSTEIN; but the really serious study of nchoscopy began with KILLIAN, whose work 97) was continued by BRÜNINGS, and these two n may be said to have laid the foundation of r knowledge on the subject. KILLIAN and ÜNINGS, using proximal illumination of their strument, were followed by EINHORN, whose genious idea of distal illumination led up to the illiant technique of CHEVALIER JACKSON. The ses which he described a year ago in moving ctures to the Medical Society of London[1] were a velation to many who were present, and there is tle doubt that his inspiration has had much to with the increasing interest in bronchoscopy in is country. During the period of ten years ding 1928 bronchoscopic examinations to the umber of 7373 were performed in his clinic at hiladelphia, and some estimate of this work can e made from the fact that one of his assistants, r. C. J. BUCHER, recently published[2] the bacteriogical findings in 118 cases of pulmonary abscess reated by means of the Jackson bronchoscope. f recent years F. HASLINGER has introduced a ew instrument, extensively used in his clinic at ienna, retaining the proximal illumination of RÜNINGS. Numerous other instruments are in se, most of them modifications of JACKSON's.

In our present number we give an account of the se of bronchoscopy for diagnostic purposes by Dr. A. J. SCOTT PINCHIN and Dr. H. V. MORLOCK who, having used the Jackson and Haslinger nstruments in their earlier work, have now lesigned a modification of the former with several new features. Improved forward illumination with a view of the orifices of lateral bronchi is attained by an alteration in lens position, whilst a magnified image is produced by means of a telescope—which incidentally protects the operator from being soiled with expectoration if the patient coughs. An operating telescope provides facilities for the use of forceps and drainage-tube under direct guidance, and a rotary cylinder exhaust pump provides more efficient drainage than has hitherto been possible with previous instruments. In their clinic at Victoria Park they have examined some 450 cases during the last 12 months. On the diagnostic side, with which the present paper only deals, a number of points are raised. In the first place it is made clear that bronchoscopic examination can be used by any physician who is prepared to take pains to acquire the technique. JACKSON himself once carried a bronchoscopic outfit with him on a fishing holiday and spent his time extracting fish-hooks embedded in rubber tubes whilst his colleagues angled. Bronchoscopy is no field for amateur effort: the responsibilities are too serious. But, once the technique is acquired, it is likely to become, like collapse therapy, an important part of the day's work. The cases recorded this week are instructive in their possibilities. In the pulmonary neoplasms, with partial or complete blockage of the bronchus and collapse of lung or suppuration beyond the obstruction, the diagnosis was often made on bronchoscopic examination of the distal portion of the bronchus after other methods of investigation had failed. For the moment the cases of chronic pulmonary suppuration, especially lung abscess, are of prime importance, for here cure may follow accurate diagnosis. Thus a case which had defied diagnosis for four months proved, on bronchoscopic examination, to have an abscess cavity, with an inflamed external division of the right lower-lobe bronchus which prevented natural drainage. Bronchoscopic drainage resulted in cure. In another instance an unsuspected hydatid of lung was diagnosed. Two other cases may be quoted from the record as instructive: an unexplained hæmoptysis of three years' duration was found on bronchoscopic examination to be due to the presence of a vascular septum opposite the right middle-lobe bronchus, and cured by cauterisation; in a sputumless case with doubtful basal signs the bronchial swab revealed the presence of tubercle bacilli.

The writers point out that bronchoscopic examination does not disturb the patient more than the removal of a tooth under local anæsthesia: in more than one-third of the 450 cases of bronchoscopy—all of which were done under local anæsthesia—the patient was able to go home two or three hours later. The fact that patients return regularly to the clinic week by week for the treatment of pulmonary suppuration by this means is an indication of their readiness to submit to repeated bronchoscopy. The establishment of a clinic for this purpose in a chest hospital is evidently a step in the right direction, for the steady down-hill career of many of these cases has hitherto presented a baffling problem for the physician. It may well be that in due course the bronchoscope, which has hitherto been regarded as part of a surgeon's equipment, will become to the physician as valuable as the pneumothorax outfit and the thoracoscope.

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[1] THE LANCET, 1930, ii., 1071.

[2] Amer. Jour. Med. Sci., 1930, clxxix., 406.

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LITERATURE AND SAMPLES ON REQUEST FROM

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ibsidiary problems of vision affecting infants school-children. The Physiology of Vision mittee of the Medical Research Council have consulted with the object of arranging for an inquiry, and it seems likely that the project materialise.

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JRTHER PROGRESS IN THE ISOLATION OF THE VITAMINS.

FTER a long preliminary period in which ation of vitamins seemed a very remote possi- y, we have suddenly arrived at a time when orts of isolations jostle one another for room in press. Within the last few weeks fresh claims e been made concerning vitamins A, B_1, C, and The work of O. and A. RYGH[1] on the anti- rbutic vitamin C was briefly mentioned in our ding article of Dec. 12th, 1931, but examination the paper by them which has since become ilable cannot be said to inspire confidence. They that narcotin, irradiated with ultra-violet light, l one of its derivatives, prevented the develop- nt of symptoms of scurvy in guinea-pigs on a rbutic diet; but the number of animals used is ry small and they were all in bad health or tually died, even though symptoms of scurvy re not recognised. Further, they found that rvy was not prevented by doses of material ghtly higher than those which did prevent it—a ry ususual phenomenon. As regards vitamin B_1, NDAUS and his co-workers,[2] previously asso- ated with the isolation of vitamin D, claim to have epared a crystalline antineuritic vitamin from east. Rice polishings is the material which has therto most generally been used for the prepara- on of concentrates but in this case the same ethod, the well-known one of JANSEN and ONATH, has been applied to yeast. A crystalline icrolonate, chlor-aurate, and hydrochloride were repared and the hydrochloride, when injected into igeons suffering with polyneuritis, was effective n a minimum dose somewhat smaller than that f any previously prepared concentrate. A formula s assigned to the substance, which differs from JANSEN and DONATH's by including sulphur in the molecule. At the Royal Society last week, a description was given of the further purification, by R. B. BOURDILLON and his team, of their crystalline preparation of vitamin D. The product previously obtained by vacuum distillation of the products of the ultra-violet irradiation of ergo- sterol was further purified by esterification, by which process the antirachitic activity was doubled. The substance thus obtained is believed to be the same as the vitamin D_2 of O. LINSERT and A. WINDAUS. It would appear also that the vitamin D_1 of WINDAUS is a compound of vitamin D_2 with an inactive substance, referred to as sterol *x*. For vitamin A an isolation is announced by P. KARRER[3] and his co-workers and J. C. DRUMMOND, I. M. HEILBRON, and R. A. MORTON. The substance obtained by KARRER is not from the classical source, the cod's liver, but from the liver of other fishes (*Scombcresox saurus*, a species of mackerel, and *Hippoglossus hippoglossus*, the halibut); the liver oil of both of these is vastly richer in vitamin A than that of the cod. The final separation was effected by fractional adsorption on fibrous alumina and subsequent elution. The product was an alcohol and could be esterified; when recovered from the ester it had the same composition and gave the same value with the antimony tri-chloride test as before. The formula given is either $C_{20}H_{30}O$ or $C_{22}H_{32}O$. A specimen obtained by distillation gave the same values. A molecular weight of 300–320 is suggested and two structural formulæ are very tentatively put forward; in both of these there is structural resemblance to carotene. It is admitted that this substance may be, though improbably, a mixture; sufficient time has not yet elapsed for the results of the all-important biological test to be known. DRUMMOND and his co-workers announced the result of their isolation of vitamin A to a meeting of the Society of Chemical Industry on Jan. 4th. Their preparation was also made from halibut-liver oil, by a process of fractional distillation, and the formula ascribed is the same as one of those obtained by KARRER. Doubtless, in both these cases, the work of isolation has been greatly facilitated by the use of a source of the vitamin so much richer in it than cod-liver oil, on which previous attempts were made.

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[1] Rygh, O. and A.: Hoppe-Seyler's Zeit. f. Physiol. Chem., 1932, cciv., 114.

[2] Windaus, A., Tschesche, R., Ruhkopf, H., Laquer, F., and Schultz, F.: Nachricht. Gesell. Wissensch., Göttingen, 1931, Session of Dec. 18th.

[3] Karrer, P., Morf, R., and Schöpp, K.: Helv. Chim. Acta, 1931, xiv., 1431.

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VITAL STATISTICS FOR 1931.

THE Registrar-General has issued a provisional statement of the figures for birth-rate, death-rate, and infant mortality during the year 1931.

—	Birth-rate.	Death-rate.	Infant mortality-rate.
England and Wales..	15·8	12·3	66
107 county boroughs and great towns including London ..	16·1	12·3	70
159 smaller towns ..	15·6	11·3	62
London	15·0	12·6	67

The smaller towns are those with a population in 1921 of 20,000–50,000. The birth- and death-rates for England and Wales relate to the total population and are calculated on the estimated mid-1931 population. The remaining rates are calculated on provisional resident population based on the 1931 Census figures and relate to the total population for births but to the civil population only for deaths. Birth-rate (live-births) and death-rate (crude) are per 1000 population, infant mortality-rate per 1000 live-births.

The Registrar-General remarks that the birth-rate is the lowest on record, being 0·5 per 1000 below the previous lowest, recorded in 1929 and 1930. The death-rate is 0·9 above that for 1930. The infant mortality-rate is 6 per 1000 above that for 1930, but only in 1928 and 1930 has this rate been lower. These provisional figures, which are not likely to require substantial modification, have been issued for the information of medical officers of health and others.

REFRACTION OF THE EYES IN CHILDREN.

THE normal refraction of children at various ages is not easy to ascertain. It is known that the eyes of any child at birth are practically always hypermetropic with or without astigmatism. At the age of 15, however, though the condition of astigmatism, if any, will be little changed, the eyes may be either hypermetropic, emmetropic, or myopic. In a report issued by the Board of Education on an inquiry into problems connected with defective vision in school-children,[1] it is suggested that a further inquiry should be undertaken to establish a "basic scale" to determine the normal—i.e., average refraction in boys and girls of each age-group from 1 to 15. The report, which has been compiled by a committee under the chairmanship of Sir GEORGE NEWMAN, does not go very far in establishing such a basic scale, but it helps to define our knowledge of the general trend of the refractive changes in childhood, and it suggests certain improvements in the methods of dealing with the problems of vision in the schools for the consideration of education authorities. 2625 unselected children between the ages of 1 and 15 were studied, their refraction being determined by 22 skilled observers according to a uniform scheme laid down by the committee. The main conclusions reached were that simple hypermetropia is by far the commonest condition of refraction met with in children of school age and under, but that the incidence decreases as the age increases, the highest incidence being 87·4 per cent. in the boys of 1–2 age-group and the lowest 53·1 per cent. in the girls of 13–15 age-group. Whether the actual peak in the incidence of hypermetropia comes immediately after birth or between the ages of 1 and 2 appears to be uncertain. Emmetropia is comparatively rare in children under 5, being observed in only 2–3 per cent. of children at the age of admission to school. Later, the incidence increases but does not exceed 10 per cent. in children about to leave school. Myopia is decidedly rare in children under five, only five cases being found in 1166 examinations. With the higher age-groups the incidence increases. Cases followed up during a period of years provide examples of children gradually becoming more myopic as their age increases or actually changing from low hypermetropia to myopia. Astigmatism in children is generally hypermetropic, the incidence of this form varying between 10 to 20 per cent. in the different age-groups, but without, apparently, any definite relation to the age. Some individual children who were re-examined at intervals showed a gradual all-round reduction of hypermetropia, others a reduction affecting one axis, usually the one of higher hypermetropic value. Cases of myopia and mixed astigmatism were too few to base any general conclusions on, but examination of individual children revealed the expected process of change towards an increase of myopia in one or both meridia.

The results of the inquiry, as summarised in the report, "indicate that normally the eyes of children are in a dynamic condition; that at birth the normal condition is one of hypermetropia which is converted as time goes on to one of emmetropia; and that over-action in this otherwise normal process produces a condition of myopia." A practical point arising out of the establishment of this general law is concerned with the prophylaxis of myopia. Emmetropia in the young child is exceptional and may indicate a liability to myopia as the child grows older. It may be desirable that such children should be subjected to more frequent periodical examinations than others, in order that special consideration should be paid to them in the school routine before it is too late. Another practical point concerns hypermetropes. In the routine examination of the State schools the only test at present employed to select those needing special examination is ability to read accurately the distant test-type. In this test the child with a moderate degree of hypermetropia is at no disadvantage compared with the emmetrope, since he has ample power of accommodation, and the test fails to reveal how much of it he is employing. When he is using his eyes for close work the long-continued tax on his accommodative muscles may be undesirable, and may cause a form of what is generally known as "eye-strain." In conditions of enfeebled health from any cause this is only too likely to happen. The report suggests that the present system of examination is defective in this respect and might be improved. It would be comparatively easy to select those children with any considerable manifest hypermetropia for special examination under a mydriatic, though to lay down a general rule that a certain amount of hypermetropia at a certain age called for the prescription of glasses irrespective of the visual acuity would obviously be unwise. It would be well, however, that such cases should be watched so that, if general lassitude or other symptoms should occur, the possibility that glasses are needed should not be forgotten. The treatment of these children should be [illegible] individual rather than on general lines.

A reorganisation of the present system of vision testing in schools would involve a slight increase in the work and therefore in expenditure, but it would almost certainly result in an ultimate economy from the national point of view. Incipient myopes and hypermetropes would certainly be benefited by a change of policy. The committee believe, however, that a more accurate determination of the "basic scale" would supply [illegible] information of much value. They recognise that their present report needs supplementing, and that owing to the compromises necessary in [illegible]ing general conclusions from a large number of individual figures some possibilities of fallacy may have crept in. They therefore suggest that an individual whole-time worker—not a committee—be appointed to make a further investigation. The investigation, which would probably take about two years, should be so planned as to cover not only the "basic scale" but a number ure of that which the boys acquired in their es; a minimum measure, since only a single nination was made, apparently by smear, and since worms may well have been lost in the meantime. ugh the figures are too few to be of statistical e in measuring hookworm incidence in the endemic of the United States, they yet fall fairly close to rs which are. These were supplied to Stiles by e medical officers of health, and they show ; microscopical examination detected hook-m eggs in the fæces of 28·1 per cent. of 121,388 ons investigated in 1929 compared with 33 per t. of 1,087,665 examined between 1910 and 1914. se percentages are not exactly comparable since y were obtained by various techniques, and such er greatly in exactness; yet they serve to show difficult problem which confronts those who ect hookworm campaigns, seeing that in a country the forefront of our present civilisation, steady rk against the hookworm has made such little dent advance in 20 years.

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[1] H.M. Stationery Office. 1931. 9*d*.

But the objection will certainly be made that these ures take no account of any lessened intensity of ection, of that smaller number of worms per head the infected which the work of 20 years has sumably effected. The view is, indeed, widely ld that hookworm infection can be graded from ry light to very heavy according to the worm load ried, and that this grading has clinical significance. this classification a "moderate" infection is fined as one with between 101 and 500 worms. lthough these supposed worm loads are only infer-ices from egg counts made by a particular tech-ique, it is assumed that they have exact, uncon-itional and individual application. On this point ght has been thrown by L. Schapiro and E. G. auck.[2] They carried out 400 routine post-mortem xamination at the Hospital San Juan de Dios, Costa ica. All details necessary for the purpose of their aper were contained in reports on 78 whites and ne negro. Twenty-four of these 79 persons died directly from hookworm disease, showing the well-ecognised anæmia, general tissue œdema, and fatty degeneration of heart, liver, and kidneys; in them he number of hookworms was determined by careful earch of the whole length of the intestines; and the verage hookworm load was 257, in spite of the fact hat in one body 1262 necators were recovered, the number of ankylostomes not being stated. In the 55 persons dying from causes other than hookworm infection the average load was 26. While then the average load of those killed by these parasites corresponded at the time to death to the class of case which, on mathematical lines, is graded as "moderate," there must have been some of them who would have fallen into the "light" and "very light" mathematical grades, since the writers emphasise the fact, known for many years, that the clinical gravity of a case is not measured by the number of worms harboured at any moment, including that of death. Whether more worms have been harboured earlier in fatal cases is in the nature of things almost impossible to determine, since they are seen only in the last stages. At all events, in these cases the average lethal load was 257. There is an impression that a particular load of *Ancylostoma duodenale* is more harmful than an equal one of *Necator americanus*, and that the latter is essentially the worm which will be found in America. In Costa Rica necators and ankylostomes were as 53 to 47; the last five years have shown that a high or preponderant percentage of the latter has been present in Panama, Paraguay, and Tucuman. Wider and closer search may well extend the distribution of these supposed anomalies.

Schapiro and Nauck also made egg counts of the intestinal contents above and below a point in the transverse colon, and correlated these with the worm counts made from the same bodies. Since during life the egg counts for such correlations are made from fæces, it seems necessary to consider only those made from the lower colon, and perhaps merely to point out that in the first two items of a table furnished by the writers the eggs in this portion of gut were as 197,000 is to 3000, while the numbers of female worms were respectively 318 ankylostomes and 56 necators, and again 36 ankylostomes and 243 necators. Making the fullest allowance for all possible difference in laying power between the two species concerned, these figures show how erratic such correlation may well be. These latest workers add to the evidence countering the assumption that the estimation of worm loads by egg counts is a simple matter; nor does that evidence support the mathematical view that infected persons may confidently be graded into classes of clinical value. Hookworm infection is no more a mathematical problem than are the other ills of man. As Lord Dawson has put it, "Disease is not a standardised product, for, thank heaven, man preserves his individuality in sickness as well as in health; otherwise it would be an uncommonly dull world to live in."

HEREDITY AND SCHIZOPHRENIA.

THAT heredity plays an important part in the ætiology of schizophrenia has long been recognised. In a recent study of the subject,[1] Manfred Bleuler, the son of Eugen Bleuler, has examined the pedigrees of 100 schizophrenic patients at Bloomingdale Hospital, White Plains, New York. Briefly his findings were as follows: The 100 patients had 351 siblings among whom were 39 psychopaths and marked eccentrics, 9 schizophrenics, and 9 sufferers from other forms of mental disability or defect. Among the 200 parents of the 100 patients were 46 psychopaths and marked eccentrics, 4 schizophrenics, and 14 sufferers from miscellaneous disabilities of psychiatric significance. Among 1109 grandparents and collateral relatives, there were 122 psychopaths and eccentrics, 5 schizophrenics, and 23 sufferers from other mental disturbances. It will be obvious that the records of this last group must have been very incomplete. Dr. Bleuler tentatively discerns a group of six somewhat distinctive cases, in the causation of whose psychoses hereditary and familial factors appear to play no part. These six cases have certain common characteristics. They are obese dysplastics who, before the onset of the psychosis, were good-natured, sluggish, and of somewhat inferior intelligence. The illness began between puberty and the age of 26; its course was rapid and without remissions; and it terminated in a condition of advanced dementia in which the patient yet retained a capacity for affective rapport of the kind sometimes observable in idiots.

The author finds, too, that a familial incidence of abnormal traits is most marked in those patients whose schizophrenia exhibits manic-depressive features. In conducting this investigation, however, he has encountered a difficulty which, in the present state of our knowledge, is almost insuperable. Where is he to draw the line between normality and "marked eccentricity"? Of this last category, the

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[2] Amer. Jour. Hyg., 1931, xiv., 705.

[1] Journal of Nervous and Mental Disease, 1931, lxxiv., 393.

ANNOTATIONS

BIRMINGHAM HOSPITALS CENTRE.

A FORTNIGHT ago, by a majority of 42 out of 470 votes, the subscribers to the scheme for a great Hospitals Centre for Birmingham authorised the executive to proceed with the first part of the plan. This decision was reached at a meeting of the contributories over which the Lord Mayor of Birmingham presided, and at which full statements of all sides of the case were made. The proposed centre is the joint extension scheme of the General and the Queen's Hospitals and will be under the joint management of their boards, and is the result of a unanimous recommendation by a joint committee appointed by the Hospitals Council composed solely of members of the two hospitals. When the project for the establishment of a hospital centre with a medical school in proximity to, and working in connexion with, the University was first mooted it met with general acceptance, and in 14 months £620,000 (including the value of the site) was promised towards its realisation. Some interesting designs were obtained on open competition and the winning design was remarkable for its broadminded recognition of all the needs of a hospital community.[1] Of late, however, the general economic situation has aroused misgivings, and when it was decided to obtain tenders for erecting the first portion of the buildings an agitation arose which had for its object the abandonment of the scheme or, at least, its postponement to a more propitious season. It was urged that it would be impossible in present circumstances to erect and maintain a hospital with 500 beds and a medical school without seriously risking the whole voluntary hospital system of the city. In addition to the £702,000 which the work was estimated to cost, the matter of maintenance loomed up formidably. On the other hand the hospital, when completed, will have 100 pay beds, the need of which is generally admitted. In the 12 months ending with August last, the General Hospital turned away more than 2000 cases officially stated to be in need of "urgent in-patient treatment." Even so the hospital is so short of bed accommodation that day-rooms have had to be turned into wards, while, as the result of the persistent congestion, patients have had to be discharged before their time. Special departments are overcrowded, and there is no room for their expansion. One of the advantages claimed in favour of immediately starting upon the work is that economy will be consulted by the inclusion of certain of the service departments required for the complete scheme. Since the meeting referred to, however, the executive board have decided to postpone action until the beginning of next year. Meanwhile a joint appeal is being made by the General, the Queen's, and the Ear and Throat Hospital for £90,000. Of this sum £50,000 is asked for by the General Hospital, which last year treated more than 8000 in-patients and over 54,000 out-patients and casualties.

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[1] See THE LANCET, 1930, i., 317.

DIPHTHERIA IMMUNISATION.

THE deliberate immunisation of children against diphtheria is one of the most substantial advances made in recent years in sanitary bacteriology. There have been troubles and a few accidents, and our knowledge of the details of exactly what happens when toxin rather than toxoid is used is still not wholly complete. The procedure has, however, been abundantly proved to be sound and useful; that there is still room for improvement is shown in two papers published in the last number of the *Journal of Pathology and Bacteriology* (1932, xxxv., 91 and 1[illegible] by Mr. A. T. Glenny, D.Sc., and Miss Mollie Barr of the Wellcome Foundation at Beckenham. All preparations of antitoxin do not combine equally firmly with toxin, and with some of them a mixture which is neutral to a test animal in a volume of 1 c.cm. may become poisonous if it is made up with saline to 100 c.cm. That is, the toxin-antitoxin compound dissociates when it is diluted. They now show in a series of exceptionally interesting experiments that the same kind of thing may happen in the body. Thus in one experiment a series of rabbits were injected intravenously with varying quantities of the same toxin-antitoxin mixture. The animal which received 0·0005 c.cm. survived, seven rabbits which had doses from 0·001 to 0·1 c.cm. died between the fourth and eighth days, while five which received doses ranging from 1 to 10 c.cm. all survived the tenth day. The first animal lived because the amount of toxin it received was not enough to kill it, the last because the dose was so large that when it was diluted in the body fluids the degree of dissociation was not sufficient to set free a fatal amount of toxin; the intermediate animals died because they had more than enough toxin and the dilution in the body was enough to set it free. Was ever the treachery of a simple experiment so well illustrated? And Dr. Glenny substantiates his explanation by a brilliant corollary. Give a rabbit 10 c.cm. of the mixture; it will come to no harm. Two hours later draw off some of its blood and inject 1 c.cm. of its serum into other rabbits which will die unless they are protected with an adequate dose of antitoxin. It seems evident from these experiments that a toxin-antitoxin mixture which proved harmless when tested on guinea-pigs might be poisonous in a child, and it is not easy to devise any simple method of testing which would expose dangerous mixtures with certainty. For practical purposes it is fortunately unnecessary to solve these particular difficulties, since all possible source of danger can be avoided by using, instead of toxin, the modification of toxin prepared by treating it with formalin. This toxoid is not and cannot become poisonous, and it is as efficacious as toxin as an immunising agent for human use. It is clear that toxin-antitoxin mixtures should be given up.

THE MINIMAL LETHAL HOOKWORM LOAD.

Two winters ago the fæces of 73 inmates of the National Training School for Boys, Washington, were microscopically examined at the National Institute of Health and the results are now reported by C. E. Baker.[1] Sixty-seven of them came from the hookworm area of the United States, and they showed a detected hookworm infection rate of 34 per cent. C. W. Stiles[2] has already reported that none of these boys was seriously ill; some were clinical suspects, while regarding several he would have been prepared to make a diagnosis of hookworm disease on their histories, and on physical examination quite independently of the microscope. The school being urban in site and sanitation, it is unreasonable to suggest that this infection was acquired in it; it becomes then a of X rays to widespread metastases, has led school of thought to rely on small doses. The site school adopts the policy of maximal dosage hich the object is to kill each malignant cell. ig care to protect, as far as possible, the healthy e from irradiation. This direct method puts a re strain upon the patient and courage is often ed to apply a dose deemed large enough to icate the disease. The aim is to subject a given me of malignant tissue to uniform irradiation, it is claimed that an increase in the penetration of rays used leads to improved results—which is to expected from purely physical considerations if ormity of irradiation is the desideratum. To in still greater uniformity of irradiation radium ften implanted in the deeper layers of the growth n beneficial results. How the large doses used in method should be administered is a question ch is engaging many radiologists at the present e. Should the dose be given as a whole or subided? The general opinion of those advocating vy doses of X rays appears to be that split doses more beneficial than single doses. There is, vever, no general consensus about the magnitude the fractional doses to be applied to particular es of growth or the duration of time between plications.

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[1] U.S. Pub. Health Reps. 1931, xlvi., 2980.
[2] Ibid., 1930, xlv., 1763.

TREATMENT OF SUBACUTE COMBINED DEGENERATION OF THE CORD.

Liver treatment has never given the same conmt improvement in the nervous symptoms of bacute combined degeneration of the cord as it has the associated anæmia. This fact has been explained two ways. It has been maintained, in the first ace, that since the lesion is, at least in its late age, an actual degeneration of nerve tissue, complete recovery could not be expected. This view has ceived some corroboration from the finding that ses with an acute history, in which probably actual estruction of tissue has not yet taken place, do uch better than the more chronic. Secondly, r. C. C. Ungley[1] has suggested that the nervous sion is due to the lack of some factor other than he effective principle in liver, and in our present ssue he describes clinical observations to support his hypothesis. He has previously shown that the æmatopoietic potency of brain is only one-third f that of liver. Now, from treating a series of patients with severe cord lesions first with liver and then with brain, he concludes that the effect of brain upon the nervous system is markedly greater than that of liver. What the possible factor in brain may be he does not indicate, but it is clearly not vitamin A, a lack of which E. Mellanby[2] thought might be responsible for the lesions, since brain contains little of this substance. The improvement noted in Dr. Ungley's cases is definite; but it must be remembered that all observers agree that it is necessary to persist in treatment in order to benefit the nervous symptoms, and in the present experiment brain succeeded liver. Further, brain had the advantage of being given while the patients were under constant supervision, thus ensuring adequate dosage.

In another paper, on p. 230, Dr. W. Sargant suggests that iron in massive dosage will produce what is almost a biblical cure of the nervous symptoms. Knowing that the effects of liver are far from satisfactory, and acting on the observation that the blood picture is rarely of a typical pernicious type, he treated four cases, having severe nervous symptoms, anæmia and achlorhydria, with large doses of Blaud's pill. Within a few weeks two patients who were unable to walk unaided could do so, and the others were much improved. The importance of these observations is unquestionable, since the apparently incurable were cured; but their exact interpretation is open to question. Few would agree with the statement in Osler and McCrae's textbook that in subacute combined degeneration the blood picture of secondary anæmia is more common than that of pernicious anæmia. In fact, such cases in which there is no apparent anæmia may yet show a typical Price-Jones curve. Unfortunately Dr. Sargant gives no exact information concerning the character of the red cells before treatment. In all his cases there was striking hæmatological as well as neurological improvement independent of the initial colour-index. Since iron does not affect the blood picture in pernicious anæmia, except in rare cases with a dual deficiency, while the typical iron deficiency anæmia as described by L. J. Witts does not show nervous symptoms, it seems possible that his four cases fall into a group which has not been hitherto recognised. It is clear that we have still much to learn of the relationship of changes in the hæmatopoietic and nervous systems, and that this knowledge can only come from accurate clinical experiment.

SCOLIOPATHEXIS.

Under this title Dr. Egerton L. Pope,[3] professor of medicine in the University of Alberta, describes a group of conditions whose importance is undeniable. Scoliopathexis indicates a perverted state of mind in relation to disease and has as sub-groups pathomimesis, identical with malingering, and pathopleiosis, which includes the clinical types of valetudinarians, neurotics, lead-swingers, and cases of "nerves." The increase of social care for the sick, and of the legal responsibility of employers and others for accidents, is associated with a great increase in the number of such cases, and Prof. Pope appeals to his colleagues to recognise their responsibilities in lifting their patients out of their disabilities at the earliest possible date and before they have lapsed into the mire of scoliopathexis. This appeal he strengthens by warnings as to the pitfalls awaiting the clinician who fails to recognise the initial stage when compensation looms in the distance, and he notes that in pathopleiosis the outstanding motives are the acquisition of money in the form of damages, compensation, or sickness insurance, the escape from legal entanglements likely to result in financial loss or punishment, the desire for sympathy, the escape from distasteful social, domestic, sexual, and occupational relationships.

This vigorous polemic is rich in clinical information and a useful corrective to the pseudo-pathological conceptions underlying such terms as traumatic neurasthenia. Yet it contains elements of danger, and the appearance of "nerves" in the group of pathopleiosis is perhaps correlated with the absence from the bibliography of any reference to recent work on psychopathology. It is novel to read that "in the circulatory system, fainting fits, palpitation, and cardiac pain that is not cardiological, are put forward as distressing features," and to find classified as pathomimesis these well-known symptoms of an anxiety state. This is a author makes this highly significant avowal: "if we had made the concept more embracing, we could easily have included the great majority of the 294 siblings of the patients." Some of the quoted cases of psychopaths and marked eccentrics are hardly convincing. Here are two, of which the first is an example somewhat disturbing for medical readers.

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[1] THE LANCET, 1931, ii., 63.

[2] Mellanby, E.: Brain, 1931, liv., 247; see THE LANCET, 1931, ii., 917.

[3] Canad. Med. Assoc. Jour., January, 1932, p. 40.

> "26·66. Male, 41 years old, living in a foreign country. Known as an 'anxious physician' who is constantly in a state of solicitude about his patients."
>
> "30·74. Male, died at 32. Alert and optimistic, a splendid soldier. A heavy drinker who had indulged in alcohol for many years."

This is surely to cast the net widely. By slightly altering, in one direction or another, the line of demarcation between the normal and the "psychopath and marked eccentric," the percentages of the latter could be halved or doubled according to inclination. Too easily may the results of such an investigation depend on subjective factors in the author. They may depend, for instance, on the feelings he entertains towards his teachers and professional elders. If he honours and reveres these in a becoming spirit (as Dr. Bleuler does Prof. Ernst Rudin) he will be disposed to adopt criteria which will yield such data as will confirm their findings. If, on the other hand, he dislikes them, his drawing of the line will be such as to lead to wholly different results. Or the drawing of the line may be influenced by a desire, conscious or otherwise, to prove or disprove the hereditary nature of mental disorder.

In estimating the significance of genetic factors in mental diseases, the consideration of eccentricities and abnormalities in the ancestors and collateral relatives always plays a prominent part. Though the task is an exceedingly difficult one, it is desirable that an attempt be made by a competent psychiatrist or group of psychiatrists to lay down some sort of distinction between the normal and the abnormal. The line would necessarily be arbitrary, but this would not matter as long as it was definite. Its precise position should be such as to create the simplest possible criteria for the assignment of doubtful cases to one category or the other.

PEPTIC ULCER AND PULMONARY TUBERCULOSIS.

ALTHOUGH an association in the incidence of peptic ulcer and pulmonary tuberculosis has been postulated from time to time for at least three-quarters of a century, its existence has *at least as often* been both doubted and denied. Mills Sturtevant and L. L. Shapiro[1] conclude that it is the pathologists who have noted an association, while the clinicians for the most part have been sceptical of any connexion between the two disorders. They report an analysis of 7700 necropsies, made at the Bellevue Hospital, New York, among which there were 891 instances of active pulmonary tuberculosis, an incidence of, roughly, 12 per cent. Among the 120 cases with gastric ulcers and scars there were 43 in which the patient had suffered from active pulmonary tuberculosis at the time of death, an incidence of 36 per cent., or three times as high an incidence as amongst those without gastric ulcers. This difference, as it stands, is statistically significant. When the authors reject the cases of healed ulcer as possibly misleading, in that these ulcers may have existed and healed before the onset of the tuberculosis, the significant difference is not materially altered. Looking at the figures from another aspect, they find the incidence of ulcer of the stomach in all necropsies is 1·12 per cent. (86 in 7700), while the incidence of ulcer of the stomach in necropsies showing phthisis is 3·14 per cent. (28 in 891). The difference, 2·02 per cent., is three and a half times its probable error, and therefore significant by the ordinary statistical criterion. An association also is found in other groups of pulmonary and pleural diseases. Searching for a common factor the authors suggest cough: "It is known that vomiting is a cause of gastric erosions. Cough is similar physiologically, is accompanied by marked alterations in intra-abdominal pressure, and may be accompanied by vomiting, if severe and prolonged." The figures are certainly suggestive, but their meaning is by no means easy to grasp. A hospital population is a "select" population; those who die are a "selected" group *of those in hospital;* those who are submitted to necropsy are still further selected. To interpret the statistics of the post-mortem room is notoriously difficult; to argue from them to the living is dangerous. Possibly the only sound way to solve a problem of this kind is to record the relevant lesions found in a long series of cases in which death was due to accidental causes.

DOSAGE OF X RAYS IN MALIGNANT DISEASE.

SPEAKING at a discussion held by the Section of Radiology of the Royal Society of Medicine on Jan. 15th Mr. W. Mayneord said that, of the various effects of X rays, the *ionisation* they produce in air seems most capable of exact measurement. Accordingly all measurements of X ray doses should be in terms of the international r unit, and this with advantage might also be extended to radium therapy. The choice of this criterion is the more acceptable, he said, because over a fairly wide range of wave-lengths the absorption of X rays in air runs parallel to their absorption in tissue. Hence it is reasonable to suppose that the measurement of X ray doses in international r units affords a means of estimating their biological effects. From the practical standpoint the frequent measurement of the output of *X ray tubes is essential for accurate* dosage. When it is realised that the output of the tubes may vary considerably from day to day, the importance of such tests need not be stressed. In radium therapy, too, precise dosage depends on a knowledge of the amount and distribution of radium *in* each tube employed.

From the medical standpoint, on which Dr. Hernaman-Johnson and Dr. Finzi were the principal speakers, the discussion served to show that very many factors must be taken into account in the treatment of malignant disease. Apart from the determination of the doses of X rays which will be lethal to particular tumours—which is seldom an easy matter—there is the difficulty of deciding how best to cope with metastases, present or future. Because of this disturbing factor there appears to be a sharp difference of opinion about the best method of treatment. On the one hand the gratifying results often obtained by early workers using X ray apparatus of low output have led some to conclude that it is *possible to treat malignant disease* with some success without having recourse to doses of radiation strong enough to kill the primary growth. The measure of success sometimes attending the use of small doses is partly responsible for the view that the action of X rays is an indirect one, stimulating the patient's resistance to the disease. This idea, coupled with the belief that it is almost impossible to *administer* lethal

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[1] Arch. Int. Med., December, 1931.

, of X rays to widespread metastases, has led school of thought to rely on small doses. The site school adopts the policy of maximal dosage hich the object is to kill each malignant cell. g care to protect, as far as possible, the healthy e from irradiation. This direct method puts a re strain upon the patient and courage is often ed to apply a dose deemed large enough to icate the disease. The aim is to subject a given me of malignant tissue to uniform irradiation, it is claimed that an increase in the penetration of rays used leads to improved results—which is to expected from purely physical considerations if ormity of irradiation is the desideratum. To in still greater uniformity of irradiation radium ften implanted in the deeper layers of the growth beneficial results. How the large doses used in method should be administered is a question ch is engaging many radiologists at the present e. Should the dose be given as a whole or subided? The general opinion of those advocating y doses of X rays appears to be that split doses more beneficial than single doses. There is, ever, no general consensus about the magnitude the fractional doses to be applied to particular es of growth or the duration of time between plications.

TREATMENT OF SUBACUTE COMBINED DEGENERATION OF THE CORD.

LIVER treatment has never given the same connt improvement in the nervous symptoms of bacute combined degeneration of the cord as it has the associated anæmia. This fact has been explained two ways. It has been maintained, in the first ace, that since the lesion is, at least in its late age, an actual degeneration of nerve tissue, comete recovery could not be expected. This view has ceived some corroboration from the finding that ses with an acute history, in which probably actual struction of tissue has not yet taken place, do uch better than the more chronic. Secondly, r. C. C. Ungley[1] has suggested that the nervous sion is due to the lack of some factor other than he effective principle in liver, and in our present sue he describes clinical observations to support his hypothesis. He has previously shown that the æmatopoietic potency of brain is only one-third f that of liver. Now, from treating a series of patients with severe cord lesions first with liver and then with brain, he concludes that the effect of brain upon the nervous system is markedly greater than that of liver. What the possible factor in brain may be he does not indicate, but it is clearly not vitamin A, a lack of which E. Mellanby[2] thought might be responsible for the lesions, since brain contains little of this substance. The improvement noted in Dr. Ungley's cases is definite; but it must be remembered that all observers agree that it is necessary to persist in treatment in order to benefit the nervous symptoms, and in the present experiment brain succeeded liver. Further, brain had the advantage of being given while the patients were under constant supervision, thus ensuring adequate dosage.

In another paper, on p. 230, Dr. W. Sargant suggests that iron in massive dosage will produce what is almost a biblical cure of the nervous symptoms. Knowing that *the effects of liver are far from satisfactory*, and acting on the observation that the blood picture is rarely of a typical pernicious type, he treated four cases, having severe nervous symptoms, anæmia and achlorhydria, with large doses of Blaud's pill. Within a few weeks two patients who were unable to walk unaided could do so, and the others were much improved. The importance of these observations is unquestionable, since the apparently incurable were cured; but their exact interpretation is open to question. Few would agree with the statement in Osler and McCrae's textbook that in subacute combined degeneration the blood picture of secondary anæmia is more common than that of pernicious anæmia. In fact, such cases in which there is no apparent anæmia may yet show a typical Price-Jones curve. Unfortunately Dr. Sargant gives no exact information concerning the character of the red cells before treatment. In all his cases there was striking hæmatological as well as neurological improvement independent of the initial colour-index. Since iron does not affect the blood picture in pernicious anæmia, except in rare cases with a dual deficiency, while the typical iron deficiency anæmia as described by L. J. Witts does not show nervous symptoms, it seems possible that his four cases fall into a group which has not been hitherto recognised. It is clear that we have still much to learn of the relationship of changes in the hæmatopoietic and nervous systems, and that this knowledge can only come from accurate clinical experiment.

SCOLIOPATHEXIS.

UNDER this title Dr. Egerton L. Pope,[3] professor of medicine in the University of Alberta, describes a group of conditions whose importance is undeniable. Scoliopathexis indicates a perverted state of mind in relation to disease and has as sub-groups pathomimesis, identical with malingering, and pathopleiosis, which includes the clinical types of valetudinarians, neurotics, lead-swingers, and cases of "nerves." The increase of social care for the sick, and of the legal responsibility of employers and others for accidents, is associated with a great increase in the number of such cases, and Prof. Pope appeals to his colleagues to recognise their responsibilities in lifting their patients out of their disabilities at the earliest possible date and before they have lapsed into the mire of scoliopathexis. This appeal he strengthens by warnings as to the pitfalls awaiting the clinician who fails to recognise the initial stage when compensation looms in the distance, and he notes that in pathopleiosis the outstanding motives are the acquisition of money in the form of damages, compensation, or sickness insurance, the escape from legal entanglements likely to result in financial loss or punishment, the desire for sympathy, the escape from distasteful social, domestic, sexual, and occupational relationships.

This vigorous polemic is rich in clinical information and a useful corrective to the pseudo-pathological conceptions underlying such terms as traumatic neurasthenia. Yet it contains elements of danger, and the appearance of "nerves" in the group of pathopleiosis is perhaps correlated with the absence from the bibliography of any reference to recent work on psychopathology. It is novel to read that "in the circulatory system, fainting fits, palpitation, and cardiac pain that is not cardiological, are put forward as distressing features," and to find classified as pathomimesis these well-known symptoms of an anxiety state. This is a author makes this highly significant avowal: "if we had made the concept more embracing, we could easily have included the great majority of the 294 siblings of the patients." Some of the quoted cases of psychopaths and marked eccentrics are hardly convincing. Here are two, of which the first is an example somewhat disturbing for medical readers.

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[1] THE LANCET, 1931, ii., 63.

[2] Mellanby, E.: Brain, 1931, liv., 247; see THE LANCET, 1931, ii., 917.

[3] Canad. Med. Assoc. Jour., January, 1932, p. 40.

> "26·66. Male, 41 years old, living in a foreign country. Known as an 'anxious physician' who is constantly in a state of solicitude about his patients."
>
> "30·74. Male, died at 32. Alert and optimistic, a splendid soldier. A heavy drinker who had indulged in alcohol for many years."

This is surely to cast the net widely. By slightly altering, in one direction or another, the line of demarcation between the normal and the "psychopath and marked eccentric," the percentages of the latter could be halved or doubled according to inclination. Too easily may the results of such an investigation depend on subjective factors in the author. They may depend, for instance, on the feelings he entertains towards his teachers and professional elders. If he honours and reveres these in a becoming spirit (as Dr. Bleuler does Prof. Ernst Rüdin) he will be disposed to adopt criteria which will yield such data as will confirm their findings. If, on the other hand, he dislikes them, his drawing of the line will be such as to lead to wholly different results. Or the drawing of the line may be influenced by a desire, conscious or otherwise, to prove or disprove the hereditary nature of mental disorder.

In estimating the significance of genetic factors in mental diseases, the consideration of eccentricities and abnormalities in the ancestors and collateral relatives always plays a prominent part. Though the task is an exceedingly difficult one, it is desirable that an attempt be made by a competent psychiatrist or group of psychiatrists to lay down some sort of distinction between the normal and the abnormal. The line would necessarily be arbitrary, but this would not matter as long as it was definite. Its precise position should be such as to create the simplest possible criteria for the assignment of doubtful cases to one category or the other.

PEPTIC ULCER AND PULMONARY TUBERCULOSIS.

ALTHOUGH an association in the incidence of peptic ulcer and pulmonary tuberculosis has been postulated from time to time for at least three-quarters of a century, its existence has at least as often been both doubted and denied. Mills Sturtevant and L. L. Shapiro[1] conclude that it is the pathologists who have noted an association, while the clinicians for the most part have been sceptical of any connexion between the two disorders. They report an analysis of 7700 necropsies, made at the Bellevue Hospital, New York, among which there were 891 instances of active pulmonary tuberculosis, an incidence of, roughly, 12 per cent. Among the 120 cases with gastric ulcers and scars there were 43 in which the patient had suffered from active pulmonary tuberculosis at the time of death, an incidence of 36 per cent., or three times as high an incidence as amongst those without gastric ulcers. This difference, as it stands, is statistically significant. When the authors reject the cases of healed ulcer as possibly misleading, in that these ulcers may have existed and healed before the onset of the tuberculosis, the significant difference is not materially altered. Looking at the figures from another aspect, they find the in[illegible] of ulcer of the stomach in all necropsies is 1·12 per cent. (86 in 7700), while the incidence of ulcer of the stomach in necropsies showing phthisis is 3·14 per cent. (28 in 891). The difference, 2·02 per cent., is three and a half times its probable error, and therefore significant by the ordinary statistical criterion. An association also is found in other groups of pulmonary and pleural diseases. Searching for a common factor the authors suggest cough. "It is known that vomiting is a cause of gastric erosions. Cough is similar physiologically, is accompanied by marked alterations in intra-abdominal pressure, and may be accompanied by vomiting, if severe and prolonged." The figures are certainly suggestive, but their meaning is by no means easy to grasp. A hospital population is a "select" population; those who die are a "selected" group of those in hospital; those who are submitted to necropsy are still further selected. To interpret the statistics of the post-mortem room is notoriously difficult; to argue from them to the living is dangerous. Possibly the only sound way to solve a problem of this kind is to record the relevant lesions found in a long series of cases in which death was due to accidental causes.

DOSAGE OF X RAYS IN MALIGNANT DISEASE.

SPEAKING at a discussion held by the Section of Radiology of the Royal Society of Medicine on Jan. 15th Mr. W. Mayneord said that, of the various effects of X rays, the ionisation they produce in air seems most capable of exact measurement. Accordingly all measurements of X ray doses should be in terms of the international r unit, and this with advantage might also be extended to radium therapy. The choice of this criterion is the more acceptable, he said, because over a fairly wide range of wave-lengths the absorption of X rays in air runs parallel to their absorption in tissue. Hence it is reasonable to suppose that the measurement of X ray doses in international r units affords a means of estimating their biological effects. From the practical standpoint the frequent measurement of the output of X ray tubes is essential for accurate dosage. When it is realised that the output of the tubes may vary considerably from day to day, the importance of such tests need not be stressed. In radium therapy, too, precise dosage depends on a knowledge of the amount and distribution of radium in each tube employed.

From the medical standpoint, on which Dr. Hernaman-Johnson and Dr. Finzi were the principal speakers, the discussion served to show that very many factors must be taken into account in the treatment of malignant disease. Apart from the determination of the doses of X rays which will be lethal to particular tumours—which is seldom an easy matter—there is the difficulty of deciding how best to cope with metastases, present or future. Because of this disturbing factor there appears to be a sharp difference of opinion about the best method of treatment. On the one hand the gratifying results often obtained by early workers using X ray apparatus of low output have led some to conclude that it is possible to treat malignant disease with some success without having recourse to doses of radiation strong enough to kill the primary growth. The measure of success sometimes attending the use of small doses is partly responsible for the view that the action of X rays is an indirect one, stimulating the patient's resistance to the disease. This idea, coupled with the belief that it is almost impossible to administer lethal

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[1] Arch. Int. Med., December, 1931.

SPECIAL ARTICLES

E MEDICAL ASPECT OF WINTER HEALTH RESORTS AT HOME.

IQUIRY at coastal resorts in the south and west England has revealed the presence there this uary of many who wintered a year ago on one of seaboards of France or Italy, in Egypt or Madeira, still further afield. More intimate inquiry will e revealed further that some at least of them have wed their intention of not doing so again. The riotic motive, even should its springs persist, will carry them through a second winter without the enities to which they have been accustomed. iat is the proportion of these "oncers" it would convenient to the hotel industry to know; for n this winter things are none too prosperous, as a mber of the usual guests have been kept at home immediate lack of money or anxiety for the future. less there is a prospect for the English hotelier another good winter he naturally hesitates to bark on providing expensive attractions. But less some attractions are provided the "oncers" ll not come again—a rather pretty illustration of a cious circle and one that formed the unspoken ckground of the conference (briefly reported our last issue) just held at Paignton on Torbay. he conference was not strictly a medical one—the iairman stated at the outset that local doctors had ken little part in its organisation—but a number of edical delegates were present, among them county ealth officers and representatives of the medical dvisory committee set up at the meeting held at the nstitute of Hygiene on Dec. 9th, 1931, when a statement about winter marine resorts was issued.[1]

The statement referred to the inadequate equipment of many coastal resorts climatically suitable or winter visitors, and this was admitted at the Torbay conference by the recurring emphasis on the eed at every resort of something like a winter garden o provide a social meeting place with varied pportunities of healthful recreation. In an impressive letter which was read to the conference Mr. Cyril Maude said it had always appeared to him that those catering for the urban visitors who sought release in salubrious air and lovely surroundings had never properly reckoned with the increased love of good music and entertainment, or with the growth of a democratic desire for a mixing of the classes in the enjoyment of pleasures and recreations He suggested the levy of a tax on visitors which would entitle them to unrestricted use of a central pavilion for this purpose, and several speakers pleaded for the abolition of certain restrictive legislation. But apart from artificial aids of this kind the feeling was expressed that coastal resorts should not omit to make known and accessible the charms of their own hinterland. Especially in the mild climate of Devon and Cornwall is it possible in winter still to enjoy the many natural interests of the countryside which have turned these counties into a summer playground.

Two resolutions were passed at the conference. One urged the immediate formation of a British Coast Resorts Association on the rather ambitious lines enumerated by Sir Humphry Rolleston at a second meeting held at the Institute of Hygiene on Jan. 11th when Lord Riddell presided. This meeting was not itself unanimous on the need for such an association. Its only immediate outcome was to set up another committee to consider the advisability of forming such an association. The other resolution of the Torbay conference, proposed by the town-clerk of Penzance, advised coastal municipalities to set up their own local committees consisting of all the elements concerned, including the medical profession. The function of such a committee would be first to try to improve the amenities of the locality, and secondly to collect medical information as to its suitability or otherwise for particular kinds of patients or seekers after health.

This proposal, we are satisfied, is of far-reaching importance. It is almost beyond belief that in any resort which depends largely for its prosperity on a regular influx of winter visitors, many of them weary and infirm if not actually ill, there should be no common meeting-ground of doctors, hoteliers, and municipal officers to consider the best interests of their guests and clients. But so it is. We hold no brief for continental methods, regarding it seemly for our own resorts to develop naturally on their own lines, but there can be no question that, wherever claims are made for any locality of health-giving properties, they should be made, as in all important continental resorts, by a consensus of the local medical fraternity; these should meet to consider how far these claims can be justified by medical knowledge and in what way they can best be honoured, appointing spokesmen to keep their views before a local executive committee. Had there been in each resort such a committee of action, the problems of the present winter might have been squarely faced and appropriate action taken. It is clear that some central association will be needed to codify, collate, coördinate, and distribute the information supplied by such local committees. It may be too late in the present season to develop a complete central association, but something might be done to set up a central organisation to serve the medical interests of the health resorts of the whole country. Certainly it is not too late for every coastal municipality to set its own house in order.

SCOTLAND.

(FROM OUR OWN CORRESPONDENT.)

UNDERGRADUATES AND OFFICIAL DUTIES.

THE students' representative councils of the four Scottish universities lately held their annual conference at Edinburgh and were addressed by Sir Thomas Holland, Principal of the University. Sir Thomas said that the student who took no part in the social and athletic activities of his undergraduate body was not worth a degree; but when his share was so great that his academic work definitely suffered he showed a lamentable deficiency in his sense of proportion. For that share he would have to pay a very heavy tax for the rest of his later years. The speaker often worried over the problem of the student who had enforced duties of that kind to carry on. Most forms of recognition of such work would destroy automatically and at once the very value of the experience. The nearest he could imagine to anything like actual notable change from the war-time practice of calling such cases "disordered action of the heart" and setting up special heart hospitals for their study, but to regard them as examples of malingering is equally *fatal to understanding.* Although he pleads that psychotherapy and mental hygiene should have a place in the teaching of clinical therapeutics, yet Prof. Pope's therapy does not seem to have developed beyond the simple principles of assuring the patient that there is nothing the matter with him and then urging him to work. Anyone familiar with the treatment of intelligent "neurotics" knows of the resentment aroused by this method—useful though it may be in selected cases—and even among compensation cases are to be found men whose condition demands informed therapy, which, under present conditions, is unobtainable and in the absence of which they have no alternative but to cling to compensation. With such men the assurance that there is nothing the matter is a direct invitation, almost a compulsion, to produce symptoms that will prove their case. *The stigma attached to* "nerves" is a hindrance to diagnosis and treatment, and Prof. Pope's reference to war cases reminds us how for a time the mental origin of shell-shock was denied as a libel upon brave men. After stern necessity had enforced a correct view, the psychopathologist then had to fight a battle on another front and defend the sufferers against that therapy which would abolish shell-shock by shooting every man that had it. The statement is true that the legal discontinuance of pensionability for the so-called neuroses would probably lead to great economic saving and eliminate a great deal of valetudinarianism, but how would we apply this principle to telegraphists' or writers' cramp ? The answer is already known to the psychopathologist, for the stigma of neurosis has for years prevented us from admitting that these disorders are psychologically determined. The view, now gaining ground, that the compensated disability called miners' nystagmus is largely psychoneurotic would be rightly resisted if Prof. Pope's generalisation represented all that can be offered in the way of understanding and treatment. "Nerves" involve some of the most pressing problems of medicine, and the recognition in a particular case that symptoms do not depend upon physical morbidity is only the beginning of diagnosis, whilst to treat the sufferer from pathological fears or tormenting impulses with doses of optimistic psychology is often the negation of effective therapy. *In industrial cases the granting of compensation* without treatment, or even accurate diagnosis, has brought about a situation that justifies Prof. Pope's warnings as to our share in producing it ; but we must remedy our neglect of psychopathology before we dare exercise moral judgments upon the victims of scoliopathexis.

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[1] See THE LANCET, 1931, ii., 1373.

THE STERILISATION OF WATER BY CATADYN SILVER.

THE problem of sterilisation of water on a scale much smaller than is required by a town's waterworks, and much larger than that of the laboratory, is not an easy one, as those can testify who have had to advise on water-supplies for country houses or small isolated institutions. A process for which great claims have been made—the catadyn process of Herr Krause—has been carefully investigated by Dr. E. V. Suckling, who read a paper on his work at the Public Works, Road, and Transport Congress, held in November at the Agricultural Hall. The process is more or less a secret one ; silver in a finely divided form is somehow dispersed over the surface of sand, which is used as a filtering material for the water to be sterilised, or the silver may be distributed on the inner surface of a vessel in which the water is stored. A very *minute* quantity of silver goes into solution, if indeed this is the proper term, and it is claimed that this small amount, which is of the order of one to six parts per hundred million, will effectually sterilise the water. Dr. Suckling finds that under favourable conditions this claim can be substantiated. The process is slow and delicate, and applicable mainly to waters which are not highly polluted with sulphides, chlorides, iron, or organic matters such as are often found in waters which need sterilisation. It is also costly for use on a large scale. In spite of these drawbacks, which for the present unfit the process for use on the large scale. the entire absence of odour and taste production and the simplicity of the method suggest that it may be found of use in making water fit for drinking when travelling. The catadyn vessels which can be *obtained in this country* might ease the lot of the *continental traveller who,* when he does not wish to drink the wine of the country, is forced to choose between what he fears may be diluted sewage and excellent bottled water costing nearly as much as wine and indistinguishable in taste from good tap water. Dr. Suckling expressly *states that* his experiments, which are fully set out in the paper, were only on the laboratory scale, but they are welcome as affording trustworthy information about an attractive process.

NERVOUS COMPLICATIONS OF GLANDULAR FEVER.

INVOLVEMENT of the central nervous system in glandular fever has not hitherto been suspected but recently two cases have been reported, one from Scandinavia and one from America, that suggest its occurrence. In the first of these, described by A. H. Johansen,[1] the diagnosis does not seem fully established and indeed the only symptom characteristic of glandular fever was a high degree of lymphocytosi associated with the presence of lymphoblasts General glandular swelling, splenomegaly, an other signs were absent. The second case described by G. H. Epstein and M. Aameshek, Th presents a much more typical picture. characteristic blood changes were fully developed there was general enlargement of the lymph glands palpable spleen, and tonsillitis. In both cases th cerebral conditions were present at the onset of th disease, lasted throughout its course, and ended i complete recovery. Their character was that of simple aseptic meningitis associated with excess o lymphocytes in the spinal fluid, and in one of the cases with an increase in its total protein content It is not possible to say whether in these cases th cerebral condition and the glandular fever wer entirely distinct or whether they were both manifestations of the same infection. The latter view which is supported by Epstein and Aameshek, is b no means improbable. Glandular fever is obviousl a generalised infection, and though it mainly attack the lymphoid system the appearance of hæmorrhagi nephritis as a complication of some cases shows tha it can at times involve other tissues. There seem no reason therefore why the central nervous system should not occasionally be involved.

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[1] Acta Med. Scand., 1931, lxxvi., 269.
[2] New Eng. Jour. Med., 1931, ccvi., 1238.

particularly in the collection and distribution aman immune serum. In 1928, a similar com- ee was set up in Sydney, under the chairmanship ir Charles Clubbe, who was instrumental in its ıation. This committee is understood to have ıt 5000 c.cm. of human immune serum available. results of the use of the serum in the preparalytic es have been very good.

SHIPS' DOCTORS.

bout a year ago public attention was drawn to the that a man, who had been taken ill on the passage n New Zealand to Australia, had died because re was no surgeon on board the ship to perform an ration. It was stated, at that time, that as the was registered in New Zealand, the matter of king it compulsory for mail steamers to carry tors rested with the Commonwealth authorities l not with the State Government of the port of ival. It has now been announced that the mmonwealth Minister for Transport intends to e action to test the application of the Australian vigation Act to ships registered in New Zealand d trading between the Dominion and Australia. section of the Act requires that a medical man shall carried on every ship proceeding on a voyage of ore than 650 miles, which has 100 or more passengers board. Under protest, the company has placed medical officer on board the ship. It is understood at, in the event of any passenger ship leaving for ew Zealand without a medical officer on board, the ommonwealth Government will immediately institute proceedings against the company concerned.

EPIDEMIC DISEASES AT LORD HOWE ISLAND.

Lord Howe Island, a dependency of the State of lew South Wales, is a boomerang-shaped island, bout seven miles long, lying 450 miles E.N.E. of ydney. The islanders originate from a party of hree white seamen and some Maori women and oys, who reached the island in 1833 and formed the irst settlement. Some of the descendants of these ioneers still reside on the island, the total population of which is about 120. They live on the palm industry, which is conducted on a communal plan, so that each islander will get an adequate living. Only two epidemics of infectious disease are known to have occurred, the first being in 1868, when some of the Pitcairn islanders visited Sydney in the schooner *Pacific*, contracted measles on the return journey and were obliged to call at Lord Howe Island, where the disease broke out after their departure. The second, an epidemic of scarlet fever, thought to have been carried there by a tourist, was in 1929–30. The disease was at first not recognised, for there is no medical practitioner on the island, the medical services being rendered by the schoolmaster's wife, who is a trained nurse. A medical man, who was on a visit with a tourist party, was asked to see some of the sick and immediately recognised the disease as scarlet fever. There were 17 cases, one of which proved fatal.

It is of interest that rats were unknown on the island until 1918, when a number made their way ashore from a stranded vessel. They are causing great damage to the palm industry.

VITAL STATISTICS FOR NEW SOUTH WALES, 1930.

The report of the director-general of public health for New South Wales shows that the birth-rate (20·94 per 1000), the general death-rate (8·54 per 1000), and the infantile mortality-rate (49·72 per 1000 births) are the lowest yet recorded in the State. The low death-rate is attributed to the absence of epidemic diseases of the respiratory system and a decline in deaths from diseases of the heart and from cancer. There were increases in the deaths recorded from measles, enteritis, and gastritis in children, and suicide.

THE HOBART PUBLIC HOSPITAL.

A Royal Commission has just been held to inquire into certain irregularities, and to report on the administration, management, and control of the Hobart Public Hospital. In the summary of the conclusions of a scathing report, it is recommended *that the present system should be replaced by an honorary system, and that an honorary medical staff should be developed. The position of surgeon superintendent, it is proposed, should be abolished, and a medical superintendent should be appointed to direct the medical services of the hospital, the administration of the institution to be mainly in the hands of the secretary.*

IRELAND.

(FROM OUR OWN CORRESPONDENT.)

THE MEDICAL REGISTER OF THE IRISH FREE STATE.

A FEW weeks ago a public health authority in the County Dublin appointed as locum tenens medical officer of a dispensary district a man holding the medical degrees of the National University, and at present occupying a position as house surgeon in England. When the appointment was submitted for approval to the Department of Local Government and Public Health, the Minister pointed out that this practitioner's name did not appear in the Medical Register of the Irish Free State. and that, under the Medical Practitioners' Act, 1927, no one could hold an appointment as physician or surgeon in the Irish Free State under any local authority maintained wholly or partly out of the rates unless his name was on the Register of the Irish Free State. It was announced that the practitioner refused to register in the Irish Free State, and consequently the appointment lapsed. It is curious that nearly five years after the establishment of the Register it should still need to be pointed out that practice as a physician or surgeon may be undertaken in the Irish Free State only by those who are on the Medical Register of that dominion.

THE LÜBECK TRIAL.

(FROM OUR BERLIN CORRESPONDENT.)

(*Continued from p. 164*)

THE PUBLIC PROSECUTOR'S CASE.

THE hearing of witnesses and experts being finished, the public prosecutor began to plead. Nothing in his long legal career had ever, he said, struck him so much as the reading at the beginning of the trial of the names of the 75 infants who died and of the 125 who were injured. Dr. Altstädt, who had introduced the Calmette method, had done so without having had any experience with it in practice and with only some knowledge of the literature. He would not say that he and Prof. Deycke had done intentional injury, but he must maintain that they had acted in a very careless way and should be punished for having caused *death* and injury by neglect. The Lübeck Senate, relying on Dr. Altstädt as their medical adviser, had not recognition was in his own college in London, where they lived a very simple life and it was possible to make a very simple rule. Certain officials of the Union—which corresponded roughly to a students' representative council—were granted an extra year, free of fees, in order that they might not be forced at once to face the final examinations; and possibly in that way to become forced to accept a second class degree, when otherwise, if free of student activities, they might very well have got a first.

On a proposal (from Aberdeen) that the medical curriculum be extended to six years, Sir Thomas said that the limits were not fixed by mental capacity alone, but by economic considerations. Another year would mean increased cost to the student and would be an added financial burden to the university. Both sides would have to be considered.

THE BIOLOGY OF PARENTHOOD.

Prof. James Ritchie, of Aberdeen, gave as his first lecture in the Farquhar Thomson course one on the Importance of the Child and the Value of Parents. Europe, he said, with less than a fifteenth of the land surface of the earth, contained more than a quarter of the world's population. The world's population itself in 200 years has grown from a mere 500 millions to more than 1700 millions, and the threat of this steady expansion was that in course of time the world would have to exhibit a notice, as Sir Arthur Thomson put it, of "standing room only." He illustrated the problems arising out of the relations of parents and offspring in the ascending groups of the back-boned animals, in which there was an increase and specialisation of parental care.

GLASGOW'S EDUCATIONAL PROVISION FOR MENTAL DEFECTIVES.

In a recent lecture, Dr. Arbuckle Brown, deputy medical officer of health and school medical officer for Glasgow, stated that at present there are almost 1800 children in special schools or classes. Some of lower grade are also receiving instruction, but these are in *occupation* centres provided by the after-care special schools' committee. The older children from the special schools are given instruction suitable to their after-school life. The boys are drafted to centres for special trades—carpentry, boot-making, iron work, tailoring, and other occupations, both of trade and educational value. The after-care staff undertakes the supervision and encouragement of the children after they left school at 16. The number so cared for is 1300. The staff visit the homes, encourage the young people to find occupations congenial to themselves, or find places for them and maintain supervision till the staff officer is assured that they have become firmly *established and are doing* useful work. Something like 57 per cent. of the boys were employed, said Dr. Brown, but a lower percentage of the girls. The girls are more useful in domestic work and are often kept at home.

PARIS.

(FROM OUR OWN CORRESPONDENT.)

FREE ADVICE ON MEDICAL PROBLEMS.

IN a recent communication to the Academy of Medicine, Dr. R. Dujarric de la Rivière gave a brief account of a new service which has just been started in Paris. This Consultation Publique et Gratuite d'Hygiène is not a dispensary nor polyclinic where treatment is provided. For treatment, it is expressly insisted, patients must go elsewhere. But in the past they have often found it difficult, and sometimes expensive, to find this "elsewhere," and they have not always found it. Or it has not been of the best—an inevitable sequence to the haphazard ways of the past. The new service brings the public health medical officer in direct touch with individual members of the public. Tracts and pamphlets on general hygiene and special subjects are available, but the special feature of this service is not wholesale advice by pamphlets, but individual consultations at which the public health medical officer acts as guide, philosopher and friend to patients and their relatives It would, perhaps, be misleading to apply to this new service the term "clearing-house," which suggests a highly impersonal machine for sifting morbid material with the help of clerks and secretaries. The service is equipped to give expert advice on the hygiene of housing, food, physical exercises, baths and swimming baths, infant and child welfare, the care of school-children and the aged, the choice of profession, tuberculosis, syphilis, cancer, and alcoholism. Inquirers are told where they can obtain analyses of sputum, &c., what steps to take with regard to disinfection after a contagious disease, where and how they can be vaccinated against typhoid fever and diphtheria, and about the pitfalls of sanitary legislation. It augurs well for the future of this service that its sponsors are very much alive to the importance of its being run by a specialist in public health—not just anyone with a medical degree.

THE PATENTING OF SCIENTIFIC DISCOVERIES.

It will be remembered that a commission was recently appointed by the Academy of Medicine, with Madame Curie as one of its members, to investigate the possibilities and desirability of securing some reward for scientific discoverers by the patenting of their discoveries. Last June Madame Curie drafted a resolution, to which all the other members of the commission subscribed, in which she pleaded the cause of the inventor, urging that protecting his rights would not only be an act of justice to the individual, but would also generally favour the progress of science by aiding laboratories and hospitals and other institutions which serve the public. On Dec. 29th the final conclusion of Madame Curie's draft resolution was adopted at a meeting of the Academy. The text is: "The Academy declares itself in favour of the creation of the rights of the savant and recommends that the recognition of these rights should be hastened by the initiative of the public authorities."

AUSTRALASIA.

(FROM OUR OWN CORRESPONDENT.)

INFANTILE PARALYSIS IN SYDNEY.

THERE are indications that a serious epidemic of infantile paralysis may make its appearance in Sydney during the coming summer. It is not expected to reach its peak until February or March. During the last seven weeks, 52 cases have been reported with nine deaths, and 21 patients are at present under treatment at the Royal Alexandra Hospital for Children. During the epidemic of 1929, there were 241 cases with 29 deaths. In 1930, 30 cases were reported with six deaths. In 1926 a committee was formed in Melbourne with the purpose of assisting in the early diagnosis and treatment of this disease,

CORRESPONDENCE

TUBAL PREGNANCY.

To the Editor of THE LANCET.

,—Were it not for the fact that Prof. Blair Bell to feel that he is not as other gynæcologists, ould feel inclined to let his letter on Mr. Tanner's ted case of tubal gestation lie on the table as st-prandial red herring, rather than reply to is undoubtedly meant to be an educational . As Prof. Blair Bell has given expression to pinion on Mr. Tanner's treatment of his case h would be shared by few, if any, gynæcologists anding, I hope he will not mind answering the wing questions.

Is it sound surgery to conserve a tube in which bal pregnancy has occurred, when the great ability is that this tube was abnormal before the nancy (as is generally believed), and will be even normal after it has been damaged by the nancy?

. What guarantee is there that active chorionic e will not be left in the tube, to cause further ion, as is known to have occurred when the stine has had villi implanted on its surface after ubal rupture or abortion?

. What guarantee is there that large vessels tured in the tube wall, or even raw edges will not tinue to bleed if adequate control of the hæmorge is not secured by removal of the tube?

ne cannot help feeling that if Prof. Blair Bell l but visualise what he has seen and had to contend th in these cases, he will modify the views he has pressed.—I am, Sir, yours faithfully,

AUBREY GOODWIN.

ueen Anne-street, W., Jan. 25th, 1932.

To the Editor of THE LANCET.

SIR,—With regard to Prof. Blair Bell's letter in ur last issue, I did not suggest that the colouration the umbilicus was unknown but that it was rare. personal letters, Dr. J. A. Ryle and Prof. Miles . Phillips refer me to a similar case reported by . S. Cullen in Volume I. of "Contributions to Medical nd Biological Research," New York, 1919, published honour of Osler on his seventieth birthday. Prof. hillips says in his letter:

> "Although I have never seen bluish discolouration of the umbilicus, I have been on the look out for it ever since r. Cullen of Baltimore drew attention to it as a diagnostic ign."

Prof. Blair Bell criticises removal of the ampullary portion of the ruptured tube containing the pregnancy. This was done because it was the only quick and safe way of arresting hæmorrhage which had filled the abdomen with blood. Quite apart from the loss of time, removing the pregnancy alone is attended with the risk of leaving behind chorionic villi which might erode the tube or other structures such as the omentum or intestine and cause fresh hæmorrhage. Further, I suggest that such a damaged tube, if it functions again, may give rise to a second ectopic pregnancy.

Both ovaries and the left tube remained after the operation, so that my procedure was not drastic. I hope the patient does not have an ectopic pregnancy in the left tube—an event I have met with on several occasions.—I am, Sir, yours faithfully,

W. E. TANNER.

Queen Anne-street, W., Jan. 23rd, 1932.

BRILLIANT GREEN FOR SYCOSIS.

To the Editor of THE LANCET.

SIR,—Your annotation on this subject will be read with much interest. I should, however, like to state that in my hands, and in those who have adopted my plan or method, the treatment of coccigenic sycosis is neither intractable nor prolonged. Another fallacy is that this form of sycosis is liable to recur after it has been properly cured. In my experience the cure remains permanent. But, as the whole process of the disease is under complete control by correct applications, sufferers have no anxiety. The alcoholic treatment has been advocated and carried out by me during many years. Alcohol is the chief active agent in the antiseptic use of tincture of iodine, picric acid, and largely in Prof. Senin's use of brilliant green as it is in mine. One can hardly understand anyone applying disfiguring pigments to the face when pleasanter methods are available. Alcohol is a mild flocculent of proteins, either of the skin tissues or of the organisms with which it may be infected. Further, it is a powerful dehydrator, a quality highly prejudicial to the vitality of the cutaneous flora. These two activities make it the ideal antiseptic for the skin, to which it can be applied frequently without injury. Its value in sycosis depends entirely upon the oft-repeated statement of Sabouraud—that sycotic abscesses are comparatively superficial. Thus they can be reached by readily diffusible and volatile liquids.

The details of the method I adopt and advise will be found in a paper I read before the then called London Dermatological Society and later published under the title of Some Auto-infections (*Clinical Journal*, March 9th, 1921, pp. 145–150). The matter has been recently communicated to the *Dermatologische Wochenschrift* (1930, xci., 1873).

I am, Sir, yours faithfully,

Wigan, Jan. 23rd, 1932. R. PROSSER WHITE.

VACCINE TREATMENT IN INFECTIVE ARTHRITIS.

To the Editor of THE LANCET.

SIR,—In her interesting communication on this subject in your last issue (p. 178) Dr. Phyllis Congdon draws no distinction between the cases treated with stock and autogenous vaccines respectively and the proportion of each group is not given. As no details are given as to bacteriological tests of the patients on admission, it would appear that the diagnosis of *infective* arthritis was made on clinical grounds only. Furthermore, as the stock vaccine employed contained no fewer than 40 strains of streptococci, the dose of any microbe that might be present in the system of the particular patient would be very small indeed. And as it was only prepared once a year the probability is that, by the time it was received by some patients, much of its original potency would have been lost. Many pathologists would not expect a stock vaccine of this type to be very useful. Dr. Congdon gives only the initial dose of any vaccine; the dose attained is also of importance. Only streptococci are mentioned. The fact that dual or multiple infection is commonly present in arthritis is an important factor in its vaccine therapy.

I submit therefore that, even within the limits of her inquiry, the conclusion that "vaccines do not insisted on consulting the German Health Office before introducing the method in Lübeck. When Dr. Altstädt was asked at the trial whether he did not know that certain physicians in Germany and abroad had warned against an indiscriminate application of B C G he had replied that those physicians were of no importance in the medical world. He (the public prosecutor) must however state that one physician expressing doubt on the harmlessness of a remedy must be heard as much as a hundred others believing in it. Dr. Altstädt's omissions were (1) that he had neglected to ask the opinion of those who had had some experience with B C G, e.g., Prof. Prausnitz; (2) that he had not insisted on having the B C G cultivated in a special laboratory as expressly prescribed by Prof. Calmette; (3) that he had not tested the method in animals before introducing it in patients; (4) that he had not provided for a thorough observation of the infants.

Turning to Prof. Deycke, the public prosecutor said that after it was decided to introduce the Calmette method its danger was further increased by the condition of Prof. Deycke's laboratory. The majority of medical experts had given their opinion that the B C G had not become virulent but that the cultures were contaminated in Lübeck by tubercle bacilli. The question whether B C G might become virulent could not be decided by a law court but only by medical science; in his opinion however the evidence they had heard was sufficient to establish that, in this particular case, a contamination of the cultures had occurred in Prof. Deycke's laboratory. It was not clear whether Prof. Deycke or one of his assistants had made the mistake, but Prof. Deycke must be held responsible for the work done in his laboratory, especially as he had allowed a cultivation of B C G in the same room as other dangerous bacilli. Prof. Klotz must be held guilty because he had not done his duty in observing the infants within and without the hospital. The public prosecutor asked for a verdict of guilty against Dr. Altstädt and Prof. Deycke with a sentence of three years' imprisonment, against Prof. Klotz with a verdict of one year's imprisonment, and a verdict of not guilty in the case of Nurse Schütze, the charge against whom had not been proved.

Counsel for the parents said he did not, on their behalf, make any financial claim against the accused medical men, the Lübeck Senate having agreed to pay for all the damage done by the disaster. Other cities which had sent expressions of sympathy to the city of Lübeck should contribute to the expense because they had been preserved from similar disaster by the Lübeck experience. The negligence of the accused was that they believed that B C G was a virus fixe without considering the opposite views of other medical men. That opinion, though formed bona fide, should not protect them against a charge of manslaughter by neglect and a sentence of imprisonment.

THE WEEKLY RETURN.

It would be ungenerous not to acknowledge with gratitude the improved format of the Registrar-General's Weekly Return which came into being with the issue for the week ended Jan. 9th. It is just ten years since any change was made; the cover remains unaltered, but there are within many changes in type and arrangement which will make the return readier for reference, although at the moment any change may be found a little perplexing. The figures are now based on the existence of 117 instead of 1[illegible] great towns. The chief addition is to be seen in two new tables on page 3, one of which gives the annual death-rates in four recent weeks for London and 1[illegible] representative great towns as well as for the whole 117 great towns, and for six grouped areas. The other is a new table of total notifications of four principal infectious diseases showing their actual number and the expected number based on the median value of the corresponding weeks of 1923-31. From this table it will be seen at a glance that in the week ended Jan. 16th the notifications for scarlet fever, diphtheria, and enteric fever in England and Wales were 16, 14, and 16 per cent. respectively below expectation, whereas for primary pneumonia they were 44 per cent. in excess of expectation. Table 3A is another small addition giving corrected totals for England and Wales of notifications of infectious disease for the previous week, together with returns too late for inclusion in Table 3. In Table 3 itself the number of notifications for the administrative county are now given in cases where the population of county boroughs has to be deducted from that of the geographical county. Moreover, for the first time, municipal boroughs are distinguished from urban districts—a great convenience. One table has been allowed to drop out altogether; but as it has long had an archaic flavour it will not be missed except by the seeker after abstruse knowledge who wanted to know the number of stillbirths in Warsaw or the deaths from whooping-cough in Rio de Janeiro. The price of the Weekly Return remains unaltered at sixpence, and we commend it once again to the continuous study of all whose duty or hobby it is to form an accurate idea of the current health of the country.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED JAN. 16TH, 1932.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 68 (last week 68); scarlet fever, 1493; diphtheria, 956; enteric fever, 27; pneumonia, 2210; puerperal fever, 44; puerperal pyrexia, 120; cerebro-spinal fever, 50; acute poliomyelitis, 4; encephalitis lethargica, 14; dysentery, 21; ophthalmia neonatorum, 94. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on Jan. 19th–20th was as follows: Small-pox, 133 under treatment, 2 under observation (last week 115 and 2 respectively); scarlet fever, 1223; diphtheria, 1452; enteric fever, 7; measles, 758; whooping-cough, 360; puerperal fever, 17 (plus 11 babies); encephalitis lethargica, 225; poliomyelitis, 2; "other diseases," 288. At St. Margaret's Hospital there were 22 babies (plus 13 mothers) with ophthalmia neonatorum.

Deaths.—In the 117 great towns, including London, there were no deaths from small-pox, 2 (0) from enteric fever, 53 (22) from measles, 10 (2) from scarlet fever, 46 (10) from whooping-cough, 33 (7) from diphtheria, 56 (12) from diarrhœa and enteritis under two years, and 412 (145) from influenza. The figures in parentheses are those for London itself.

The fatal cases of enteric fever occurred at Eastbourne and Sunderland. Ten deaths from measles were reported from Stoke-on-Trent, 4 from Manchester, 3 each from Portsmouth and Bolton. Birmingham reported 10 deaths from whooping-cough, Liverpool 7. Of deaths attributed to influenza Birmingham stood highest with 17, followed by Manchester 14, West Ham 12, and Bradford 11.

The number of stillbirths notified during the week was 284 (corresponding to a rate of 42 per 1000 births), including 51 in London.

THE PREVENTION OF DEAFNESS.

To the Editor of THE LANCET.

,—In Dr. Sorsby's paper in your issue of 16th there is an allusion to the Zünd-Burguet ment which is neither fair nor correct. Dr. by says that in treatment "the many efforts, such the Zünd-Burguet apparatus, which aim at lucation, are of no value." A perusal of my hand- on the electrophonoide method or any of my ished cases would have made Dr. Sorsby hesitate re making so sweeping a statement. The following s of deaf children are selected because they have kept their improvement for at least four (in some) years after being pronounced "incurable" by itable otologists.

Boy, 10; catarrhal deafness. Whisper, 14 in. before; after treatment.

Boy, 8; also catarrhal. Voice before treatment, 30 in.; , 17 ft.

Boy, 8; catarrh following measles, with concomitant s of commencing internal ear deafness. Whisper, 45 in. re; 15 ft. after treatment.

Boy, 7; toxic deafness; internal ear type; after ic wound of leg. Voice before treatment, 15 in.; r treatment, 15 ft.

ese children were all ordered for deaf-schools, and now doing well at different well-known public ools. A fifth boy, whose hearing was reduced by st-suppurative processes to R. 1 ft., L. 3 ft., was proved by 5 ft. and 10 ft.

Dr. Kerr Love and I have for nearly 30 years eached consistently the prevention of deafness, and is a great satisfaction to us that our lead is now ing followed by a younger generation. To me, rsonally, it is a matter of pride that what Dr. rsby says in his paper confirms a great deal of hat I stated in THE LANCET in 1912, the *British urnal of Children's Diseases* in the same year, the *ugenics Review* in 1914, the *Practitioner* for 1915, d the *Journal of Laryngology* in 1917.

I am, Sir, yours faithfully,

MACLEOD YEARSLEY.

Harley-street, W., Jan. 20th, 1932.

CANCER OF THE LUNG.

To the Editor of THE LANCET.

SIR,—Among the annotations in your last issue see one on primary carcinoma of the lung, in which note the following observation: "If more space in the literature on bronchial carcinoma were given to diagnosis, especially early diagnosis, and less on histogenesis and metastases, the average medical reader would be grateful." There follows an account of recent clinical observations by Dr. B. M. Fried which are described as adding one new idea of importance. The writer of the annotation does not appear to be aware of the prominence given to this very aspect of the subject in Dr. Maurice Davidson's book on "Cancer of the Lung," to which, unfortunately, no reference is made. Apart from the fact that it is the only book on this subject that has been published in the English language, and that it deals with the subject mainly from the clinical and diagnostic point of view the omission, if I may say so, seems to me the more surprising since I note the volume was reviewed by THE LANCET on Nov. 15th, 1930. In view of the appeal in this annotation for practical information to meet the demands of the average medical reader, I do feel that attention should be drawn to a standard work on the subject in question.

I am, Sir, yours faithfully,

Harley-street, W., Jan. 24th, 1932. PHILIP ELLMAN.

NEMBUTAL AND CHLORAL IN CHILDBIRTH.

To the Editor of THE LANCET.

SIR,—With reference to the paper in your issue of Jan. 16th by Drs. O'Sullivan and Craner on the use of nembutal and chloral in 60 cases of childbirth at the London Hospital, I would like to make a few confirmatory statements. I have given nembutal (alone) to 18 of my parturition cases with most pleasing results. I was giving three ampoules, but now give four (easily swallowed by most patients) when the os is three-fifths dilated, or when labour is obviously in the second stage. Within 15 to 30 minutes the patient is asleep between the pains; she groans during pains, which are not lessened in frequency nor strength; in fact, in the case of two very nervous patients, my sister-in-charge of the maternity ward and I thought that the pains became more powerful under the nembutal. Labour progresses normally, and the child cries lustily when born. The patient usually sleeps for five or six hours after the child is born, and has no memory of the birth. One of my earliest cases under nembutal very greatly impressed us; when asked next day how she felt after taking the drug, and whether she had pain, she said she felt no pain, but she "felt stronger and could feel the child coming down and out." In two cases of unreduced occipito-posterior presentation and one case where the head remained transverse, ether was used while I rotated the head, and extracted with forceps, and less anæsthetic was needed than if nembutal had not been given. The puerperium in all these cases has been normal, and children healthy. It appears to me that in nembutal we have a drug which should help the general practitioner and be of great comfort to all women in childbirth.

I am, Sir, yours faithfully,

J. W. LANE,

Hilsea, Jan. 26th, 1932.
Major, R.A.M.C.; Officer Commanding, Military Families' Hospital.

MODERN HOSPITAL CONSTRUCTION.

To the Editor of THE LANCET.

SIR,—I was glad to see your comments on modern hospital construction in a leading article last week. The sanitary tower with cross-ventilated lobby was not an unmixed blessing; too often the cross ventilation was too much for the patients and staff, and the multiplicity of doors was a nuisance to the nurses carrying bed-pans to the sink room.

The experiments in balcony construction which you describe in French and German hospitals are most interesting, but the continuous balcony in front of ward windows is costly to construct, and except in special cases not always a success in the English climate. I found when visiting a well-known sanatorium in the south of England recently that the patients were not allowed by the medical staff to lie out in the sun, and the balconies were therefore of very little use. The proportion of window to wall space in the ward also requires careful consideration. The feeling of comfort and protection so important to a sick person may be lost if the ward is designed like a glass box, though large windows to the south are nearly always an advantage.

When I was a patient in a hospital during the war I was amused at the continual struggle that went on between the staff and the patients with regard to the open window. We must try to bear in mind that a draught may cause a patient intense annoyance, and appear to hold out any better prospect of improvement or cure of infective arthritis than the other methods of treatment in use" is not justified by the evidence given. It has little or no bearing on the value of autogenous vaccine therapy based on complete bacteriological examination of each individual patient.

I am, Sir, yours faithfully,
A. KNYVETT GORDON.

Bedford-square, W.C., Jan. 23rd, 1932.

FILLING UP A DEATH CERTIFICATE.

To the Editor of THE LANCET.

SIR,—As a medical officer of health I have to scan the weekly returns of deaths sent to me by the local registrars, the causes of death being compiled from the death certificates furnished by medical practitioners. Judging by the returns which come to my notice, it would appear that doctors have difficulty in allocating the causes of death as between primary and secondary causes. In this respect there seems to be no difference between those recently qualified and those who have been in practice many years. It should not be difficult to fill up a death certificate correctly if it is borne in mind that what is meant by a "primary" cause of death is the disease, present at the time of death, *which initiated the train of events leading thereto*, and not a mere secondary, contributory, or immediate cause, or a terminal condition or mode of death.

Here are a few instances of gross error which have come to my notice:—

1. Primary cause, cardiac failure. Secondary, aortic disease.
2. Primary cause, hæmatemesis. Secondary, cancer of stomach.
3. Primary cause, exhaustion. Secondary, cancer of bladder.
4. Primary cause, heart failure. Secondary, cancer of breast.
5. Primary cause, exhaustion. Secondary, pulmonary tuberculosis.

I could continue this list indefinitely, but I think I have made it clear that more attention should be paid to teaching the medical student the right way to fill up a death certificate, and I hope the teachers of public health and administration will make a note of this if they have done me the honour to read my letter.

I am, Sir, yours faithfully,
A. B. DUNNE, M.B. Camb.

Doncaster, Jan. 22nd, 1932.

ERYTHROCYTE SEDIMENTATION TEST.

To the Editor of THE LANCET.

SIR,—An annotation in your issue of Jan. 9th refers to the erythrocyte sedimentation test as an index of the activity of rheumatic infection. I have performed this test in some thousands of cases since Fahraeus sent me a copy of his book in 1922, and readings are given in all those reported in my three volumes of the "Nature of Disease" wherein also the rationale of the test is described. My conclusion is that, as rapid sinking of the red blood corpuscles runs pari passu with active dehydration of the protein particles, and as this chemico-physical change may be brought about by physical agents, chemical poisons, and micro-organisms, the test has no specific value and cannot be employed to determine if a particular organ in the body is being attacked by the invader responsible for the dehydration. Nor can it be used to ascertain when the invader ceases to be active, first, because continued activity tends to cause hydration, and secondly, because months may elapse after the invader has vanished before the reading becomes normal. Hydration checks the sedimentation of the red blood corpuscles. The test depends primarily upon the chemico-physical state in which the protein particles of the plasma happen to be and not upon the number of the red blood corpuscles or the protein content of the plasma. The suspension stability of the red blood corpuscles is reduced only in those cases of anæmia where the protein particles are being subjected to dehydration, the state in which the red blood corpuscles happen to be does not influence it. In aplastic anæmia the sedimentation rate is not increased, and in pernicious anæmia where it is the red blood corpuscles do not fall so fast as they do in streptococcic septicæmia, except just before death.

I am, Sir, yours faithfully,
J. E. R. McDONAGH.

Wimpole-street, W., Jan. 21st, 1932.

THE MIND IN TUBERCLE.

To the Editor of THE LANCET.

SIR,—In the paper by Dr. Andrew Morland with this title in your last issue (p. 176), I am particularly interested in his reference to the work of Dr. H. Banister at Papworth. Impressed by the lack of treatment in sanatoria on the psychological side, I was fortunate, some years ago, in securing the services of Dr. Banister, who is lecturer in experimental psychology at Cambridge, and whose work in our psychological clinic has been of great benefit to certain of our patients. I am convinced that Dr. Morland is right when he states:

> "In this struggle between health and disease the min plays an important part, and I believe that further understanding of the mechanism by which the mind respond to the stimulus of the disease would enable more rationa and effective treatment to be applied."

Dr. Banister, whose experience in the teaching o psychology to medical students in Cambridge i considerable, would, I am sure, agree with me that knowledge of psychology is of the utmost importanc to those whose work lies in the tuberculosis field, an as Dr. Morland so well puts it: "If the tuberculosi physician could learn so to influence the minds of hi patients that they acquired a proper attitude toward the disease, the greatest therapeutic advance of th century would have been achieved."

I am, Sir, yours faithfully,
PENDRILL VARRIER-JONES.

Papworth Hall, Cambridge, Jan. 23rd, 1932.

RUPTURE OF THE ADDUCTOR LONGUS.

To the Editor of THE LANCET.

SIR,—In his Robert Jones Essay on injuries o tendons and muscles, Mr. H. C. Edwards deprecate (THE LANCET, Jan. 9th, p. 70) immediate operativ treatment of rupture of the adductor longus. Thi leads me to record the following case. A rupture the adductor longus was sustained while playing pol The gap in the muscle was easily palpable, bein rather more than two fingers' breadth in extent Operation was carried out on the following day, an the lesion, which was situated below the pubi attachment, retained by suture. Apart from thre weeks' rest in bed no after-treatment was carried out The injury was sustained in May, in August hors exercise was resumed, and in October racing and polo

I am, Sir, yours faithfully,
LAURENCE O'SHAUGHNESSY.

Berlin, Jan. 21st, 1932.

Infirmary and physician to the Children's ary when he was sent to the south coast with nosis of general miliary tuberculosis and a few s to live. Fortunately he had the will to r. and his experience of tubercle in his own person his advice doubly valuable both to his patients to his professional colleagues. He became sian to the Royal National Sanatorium at emouth, and referee to the National Hospital onsumption at Ventnor; whilst he held appoint- s of a more general character at the Lymington District Cottage Hospital and the Swanage alescent Home for Children. His practice d him widely through the four counties of pshire. Dorset. Wilts, and Somerset, and it haracteristic of him that at 75 years of age he still meeting the large physical demands made im by a wise economy of time, while in the nce of real illness or distress of mind it is on d that his charm and kindliness knew no bounds. ad long been the senior member of the profession ournemouth, and his colleagues recognised in him rn teacher, one with whom it was impossible to or even a few minutes without learning something. ember of the College of Physicians by examination 889. he was honoured 33 years later by election e Fellowship.

e is survived by his widow, a son and three ghters.

MEDICAL NEWS

iversity of Oxford.

n examination for a *Radcliffe Travelling Fellowship* of annual value of £300, and tenable for two years, will begin he University Museum on Feb. 23rd.

andidates must have passed all the examinations required the degrees of B.A. and B.M., and must not have exceeded years from the time of passing the last examination required the B.M. degree. The successful candidate must declare that ntends to devote himself during his tenure of the Fellowship he study of medical science and to travel abroad with a view hat study. In the examination, papers will be set in physio- y, pathology, and preventive medicine, and a subject will proposed for an essay. There will also be a practical examina- n in pathology. Candidates may offer in addition a special nch of either medicine or surgery. Application must be made proper form to the Regius professor of medicine by Feb. 10th.

The *George Herbert Hunt Travelling Scholarship* is awarded thout examination every second year to a graduate in dicine of the University (of either sex) who has not ceeded five years from the date of passing the final amination for the degree of B.M.

The scholarship is of the value of £100, or such smaller sum two years of the income of the Fund provides. Candidates ust undertake to travel abroad for a period of not less than ree months for the purpose of clinical study or research in edicine. Preference is given to those who express an intention becoming surgeons or general practitioners. The next lection will be made in April, 1932, and candidates must send eir applications to the Dean of the Medical School on or before eb. 23rd.

Schorstein Research Fellowship in Medical Science.—The oard of the Faculty of Medicine is prepared to make an lection to this Fellowship in June, 1932. The board has ower, if in special circumstances it shall seem desirable, to ivide the Fellowship into two Studentships.

The Fellowship, which may be divided into two studentships, which will be of the value of £200, will be tenable for two years from Oct. 1st, 1932, in any of the medical departments at Oxford. Candidates must be graduate members of the University, holding a registrable medical qualification, and must be under 35 years of age on Oct. 1st. Application must be made in proper form to the Dean of the Medical School, not later than May 2nd.

University of Glasgow.

The *Harry Stewart Hutchison Prize* of the value of about £50, for the best writing or writings embodying original research work in a branch of medical science relating to children, will be awarded in 1933. Medical graduates (of not more than ten years' standing from their first graduation in medicine) of all British, home, and colonial universities, may be competitors. Particulars will be found in our advertisement columns.

University of London.

A ceremony for the installation of the new Chancellor, the Earl of Athlone, K.G., and for the conferment on him of the honorary degree of Doctor of Laws, will be held at the University of London on Feb. 18th, at 8.30 for 9 P.M. Members of Convocation who desire to be present are asked to communicate with the Clerk of Convocation at the University of London, South Kensington, at latest by Feb. 4th. If it is found impossible to accommodate all applicants, invitations will be issued according to priority of application.

At a meeting of the Senate on Jan. 20th the title of professor of biochemistry was conferred on Mr. Robert Robison, D.Sc., F.R.S., of the Lister Institute; and the title of reader in biochemistry on Mr. J. M. Gulland, D.Sc., and Mr. William Robson, D.Sc., of the Lister Institute and King's College respectively.

The Osler Club.

At a meeting of this club held in London on Jan. 22nd, Mr. S. J. L. Taylor read a paper on Samuel Pepys and Medicine, and Dr. W. R. Bett made a short communication on Viktor Hensen, who in 1856 discovered the glycogenic function of the liver independently of Claude Bernard.

Royal London Ophthalmic Hospital.

The annual dinner of past and present students of this hospital will be held at the Langham Hotel, Portland-place, on Thursday, Feb. 11th, at 7 for 7.30 P.M., with Sir William Lister in the chair. Application for tickets should be made to Mr. Rupert Scott, 70, Harley-street, W.1.

Pharmaceutical Society of Great Britain.

At a meeting to be held at 17, Bloomsbury-square, W.C., at 8.30 P.M, on Tuesday, Feb. 9th, Dr. H. E. Archer will speak on Biochemistry, Chemical Pathology, and Pharmacy.

National Hospital, Queen-square.

Post-graduate lectures and courses are now beginning at this hospital, and will continue until the middle of March. Particulars may be had from the Dean of the Medical School.

The Duke of Connaught and St. Thomas's Hospital.

On Jan. 18th the Duke of Connaught completed half a century as President of St. Thomas's Hospital.

Glasgow Victoria Infirmary Deficit.

A deficit of £26,748 is reported upon the last year's working. Since the paying patients' ward of 32 beds was opened nine months ago it has been fully occupied, and more than 500 cases have been treated.

Billericay Public Assistance Hospital.

An extension of this Essex hospital was opened last week. The cost has been £4000, and there are now 70 beds and accommodation for a staff of 40.

Village Settlement for Cripples.

On Friday last week Prince George visited Shropshire and laid the foundation-stone of the Derwen Cripples' Village Settlement at Gobowen, and opened the Cripples' Training College. He afterwards laid another foundation-stone to commemorate the reconstruction of the Shropshire Orthopædic Hospital adjoining. Beginning at Baschurch 31 years ago with three crippled boys and one crippled girl, the work of the hospital and training college has increased until it covers the counties of Salop, Hereford, Chester, Denbigh, Flint, Montgomery, Radnor, and Merioneth. The hospital now has 320 beds; its trained orthopædic nurses are working in many parts of the country and abroad; its after-care department has charge of between 4000 and 5000 cases, and has 34 orthopædic clinics scattered over the eight counties mentioned.

Fellowship of Medicine and Post-Graduate Medical Association.

Arrangements for next week will be found in our Medical Diary. Forthcoming special courses include one on ante-natal treatment, to be given by Dame Louise McIlroy at the Royal Free Hospital, on Fridays at 5 P.M.; one on diseases of the chest at the Brompton Hospital, all day from Feb. 8th to 13th; one on medicine, surgery, and the specialties, at the Prince of Wales's Hospital, Tottenham, all day from Feb. 15th to 27th; and one on clinical surgery, at the Royal Albert Dock Hospital on Saturdays and Sundays for two week-ends, Feb. 20th–21st and 27th–28th. An evening course for the M.R.C.P. examination, including six clinical and two pathological evenings, four lectures, two ophthalmic demonstrations, and one laboratory demonstration, will be held from Feb. 22nd to March 18th. Syllabuses may be had from the Fellowship at 1, Wimpole-street, London, W.1.

as far as possible a ward should be planned to give each patient a window so that the ventilation can be arranged to suit individual cases.

I am, Sir, yours faithfully,
L. G. PEARSON, F.R.I.B.A.

Knightsbridge, S.W., Jan. 26th, 1932.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE.

Surg. Lt.-Comdrs. V. F. Walsh, to *Bideford;* and W. P. E. McIntyre to *President*, for Medical Dept., Admiralty.

Surg. Lts. T. B. Lynagh to *Hastings*, C. H. Birt to *Victory*, for R.M. Infirmary, Portsmouth, and G. D. J. Ball to *Vindictive*.

ROYAL ARMY MEDICAL CORPS.

R. E. Gordon is granted a temp. commn. in the rank of Lt.

TERRITORIAL ARMY.

R. Woodside (late Offr. Cadet, Glasgow Univ. Contgt., Sen. Div., O.T.C.) to be Lt.

ROYAL AIR FORCE.

P. J. C. Keane is granted a non-permanent commission as a Flying Officer.

DEATHS IN THE SERVICES.

Surg.-Gen. Sir Henry Hamilton, K.C.B., I.M.S. (retd.), who died on Jan. 22nd at the age of 81, was the son of William Hamilton, of Coolaghey House, Raphoe, Co. Donegal, and was educated at Royal School in that town. Subsequently he entered the Royal University of Ireland, and in 1875 graduated at Queen's College, Belfast, in medicine and surgery. In the following year he entered the I.M.S., and in 1878–80 took part in Roberts' march from Kabul to Kandahar, and was at the battle of the latter place (mentioned in despatches); he was also senior medical officer to General Gatacre's brigade in the Relief of Chitral Expedition, and held a similar office in the operations in connexion with the Frontier risings of 1897–98 (mentioned in despatches and promoted Brigade Surg. Lt.-Col.). In the Boxer Expedition, 1900–1901, he was principal medical officer in charge of No. 2 General Hospital. He received the C.B. in 1904, and was promoted to K.C.B. in 1913.

Major-General Harold Hendley, C.S.I., I.M.S. retd., who died on Jan. 21st at the Thatched House, Caxton, Cambridge, in the seventy-first year of his age, was the son of the late T. Hendley, and received his early education at St. John's College, Hurstpierpoint. Later he studied medicine at St. Bartholomew's Hospital, and qualified with the M.R.C.S. Eng. in 1882. He entered the I.M.S. two years later, having in the meantime taken the L.S.A. At Netley he was Director-General's prizeman in pathology. He saw active service almost immediately, for he commanded the field hospital with the Suakin Expeditionary Force in 1885 (medal and Khedive's star), while in 1886–87 he was medical officer to the 7th Bengal Cavalry with the Burma Field Force (medal and clasp). Successively civil surgeon in the Punjab and at Simla he afterwards became medical adviser, Patiala State, and was D.D.M.S. in India from 1911 to 1915, in which latter year he officiated as D.M.S. Afterwards he acted as Inspector-General of Civil Hospitals and Sanitary Commissioner, and he was a member of the Legislative Chamber, Punjab. In 1917 he was acting D.G., I.M.S., and in the following year D.D.M.S. 4th (Quetta) Division, and Baluchistan Field Force (medal and clasp, and mentioned in despatches). He was awarded the C.S.I. in 1920. Major-General Hendley, who was a graduate of Durham, was an honorary surgeon to the King and an hon. associate of the Order of St. John of Jerusalem.

DONATIONS AND BEQUESTS.—The late Mrs. Matilda Helen Stewart Forbes Murray Rezin, of Old Aberdeen, among other bequests left £2000 to the Aberdeen Royal Infirmary for the endowment of a "Matilda Murray Bed"; £2000 to the Royal Aberdeen Hospital for Sick Children, for the endowment of a "Matilda Murray Bed"; £2000 to the University of Aberdeen, to endow a bursary or bursaries for students in the Faculty of Science; £500 each to the Aberdeen Asylum for the Blind, and the Morningfield Hospital, Aberdeen; £400 to the Aberdeen Dispensary and Vaccine Institution.—An anonymous donor has offered to provide £61,500 towards the cost of a new infectious diseases hospital for Wakefield.

OBITUARY

ROBERT HENRY TODD, M.D. Dub., F.R.C.S. Irel

Dr. Robert Todd, who died on Dec. 14th, at th age of 72, shortly after his return to Australia from England, will be remembered chiefly for his outstanding service in the organisation of the British Medical Association in Australia, and especially in New South Wales. He was born in London in Burlington-street, where his father, Dr. Armstrong Todd, was in practice. From schooling at Christ's Hospital he proceeded to Hertford College, Oxford, and thence to Dublin, where he graduated, and also took the diploma of State medicine in 1886. After gaining his Irish Fellowship in the following year he married, went out to Australia, and set up in practice at Maclean, Clarence River. An old injury to his wrist made it difficult, however, for him to carry on his work, and later he relinquished it and went to Sydney, where he graduated as LL.B., and was admitted to the Bar in 1894. After this he held a number of city appoint ments, including that of city coroner. In 1 he was elected a member of the Council of th New South Wales Branch of the British Med Association, and from 1908 was honorary of the branch, to which he gave almost the whol of his time until April of last year. He also acted honorary secretary for the British Medical Assc tion in Australia, and for his signal services was 1923 presented with a gold medal. He was ciated with the University of Sydney for 20 ye as lecturer in medical jurisprudence and in the of medical practice.

DR. R. H. TODD.

Among many other activities Dr. Todd honorary secretary of the Sydney Amateur C and was a member of the Taronga Park Tru (the Sydney zoological gardens), in which he wa keenly interested, and to which he rendered valuabl service. A man of great, untiring energy and kindl disposition, he was widely known and esteemed, an his helpfulness was especially manifested to th younger members of the profession who sought h advice and guidance.

EDWIN HYLA GREVES, M.D.Edin., F.R.C.P.I

THE death of Dr. Hyla Greves on Jan. 12th lea a gap in the Bournemouth medical circle which ma be hard to fill. Dr. Greves was educated at Shrew bury and Edinburgh University, and had alrea made his mark at Liverpool as pathologist to th

NOTES, COMMENTS, AND ABSTRACTS

POST-VACCINAL ENCEPHALITIS:

S ASSOCIATION WITH VACCINATION AND WITH POST-INFECTIOUS AND ACUTE DISSEMINATED ENCEPHALITIS.

BY PROF. RICARDO JORGE,
ESIDENT OF THE PUBLIC HEALTH COUNCIL OF PORTUGAL.

(*Concluded from p. 219.*)

HE virus of our hypothesis is one which only nges its character of inertia and harmlessness er stimulus by the vaccine virus; apart from this act there is no evidence of its mysterious existence. ht it not at least be possible to catch a glimpse some other forms of its activity apart from cination? Its existence would then come out of region of theory and begin to be apparent.

erebral complications of such infectious diseases ruptive fevers, small-pox, measles, and chicken-pox e been long known to classical medicine. Vaccinia ming part of this exanthematic group, it was ural to confront all these forms of encephalitis ether. Under the impetus of the questions raised the nervous sequelæ of the Jennerian inoculation, se cases were no longer looked at as mere clinical idents, but as documents through which a problem comparative pathology could be elucidated. It is England that the greatest progress has been made th the endeavour to bring these forms of encephtis together. Dr. J. Hutchinson, secretary of the lleston Committee, has tabulated the cases brought his knowledge and has kindly placed at our sposal, together with other useful information, e accompanying Table of fatal cases notified since 27. Moreover, earlier literature dating back long fore the advent of post-vaccinal encephalitis has ready also produced some important contributions.

Are these so-called post-infectious types of cephalitis the same as the post-vaccinal? To firm it on the grounds of clinical similarity alone ould be dangerous; the basis of their identification anatomopathological. Histological examination s shown the identity of lesions in the nervous ssues affected; they present the same Perdrauouman seal as vaccinal encephalitis. This is the athognomonic test, and in face of it the only ses which one ought to consider as definitely roved are the recent ones which have been submitted the test of the microscope.

Encephalitis Post Infectionem.

MEASLES.

Measles, the commonest of the group of exanthematic diseases, has provided the largest number of xamples. The first known case goes back to 1790 Lucas, cited by Greenfield[25]). Fresh cases are ollected day by day, but it is difficult to decide if ncephalitis after measles is in fact becoming more ommon or whether practitioners are only now becoming more alive to its presence. One may surmise, however, that they are really becoming more common. Ford[29] was able to recover in 1928 113 cases from the literature to which he himself added 12. There were 25 fatal cases in England for the period 1927–30 inclusive, composed in age-groups as follows:—

0– 5 years	.. .. ..	16
6–15 "	.. .. ..	8
16 et seq.	.. .. ..	1

Greenfield, 1929, published four observations, the most interesting of which have been included in the Further Report.[3] Benn[30] has lately added two fatal cases with autopsies.

Table showing Fatal Cases of Infectious Disease with Nervous Complications, recorded in England, 1927–1930 inclusive.

Malady.		Age-groups.			Total.	
		0–5	6–15	16–		
INFLUENZA.	Encephalitis	8	9	71	88	99
	Meningitis	4	1	2	7	
	Meningo-encephalitis	2	1	1	4	
MEASLES.	Encephalitis	12	5	1	18	25
	Meningitis	4	2	—	6	
	Poliomyelitis	—	1	—	1	
VARICELLA.	Encephalitis	1	—	—	1	8
	Meningitis	5	—	—	5	
	Convulsions	2	—	—	2	
VARICELLA and WHOOPING-COUGH.	Meningitis	1	—	—	1	
WHOOPING-COUGH.	Encephalitis	2	—	—	2	4
	Meningitis	2	—	—	2	
SCARLATINA.	Encephalitis	—	—	2	2	
SMALL-POX.	"	—	1	1	2	
DIPHTHERIA.	"	—	1	—	1.	
—		—	—	—	142	

In Germany, Lust[31] described in 1926 4 cases, Bergenfeld 1, Shick 4, Redlich 1, Wohlwill[32] 2 in *1928* with post-mortem examination. In Austria two were observed by Bregman and Ponckz. In France, where Comby had observed two cases in 1921, a case in a normal convalescent after measles has recently been demonstrated by Lechelle, Bertrand, and Fauvert before the Société Médicale des Hôpitaux.[33] At the autopsy it was noticed that the demyelinisation was clearly present, though less accentuated than in others described. In Italy, in 1929, a case was recorded by A. Signa and two by Suvinian (cited by Comby[34]). In the United States, Musser and Hauser[35] recorded eight cases in 1928, collected during the course of an epidemic of 351 cases admitted to the New Orleans Hospital; in 1930, Zimmermann and Yannet gave an account of two cases, and in the following year Ferraro and Scheffer six cases.[36] At Rio de Janeiro, Martinho recorded in 1929 a case of post-measles encephalitis attended by himself (cited by Comby[34]). At Montevideo, Morquio[37] published eight personal observations with one death. The types were varied, acute diffuse encephalitis predominating.

This encephalitis following measles presents the following pathological characteristics:

It appears in children, measles being predominantly an infantile disease.

The attack occurs at varying periods after the onset of the measles. It may begin at the very onset of the measles attack. As a general rule, it follows the appearance of the rash at variable intervals—more usually, however, it appears after the defervescence and the rash has disappeared. It has been observed also during convalescence, or several days, or even weeks, after recovery.

Its incidence is not in conformity with the severity of the cases; light attacks can be accompanied or followed by nervous complications. According to Ford, the encephalitis supervenes in four cases out of 1000.

Its fatality is relatively low. Only about 10 per cent. of the cases at most are fatal; recovery is the rule, although often accompanied by sequelæ.

The symptomatology reproduces the forms and the known types of acute encephalitis; the lesional type conforms to Perdrau's scheme. Proof of this has been plainly demonstrated in recent cases submitted to autopsy and controlled microscopically. For example, the cases of Wohlwill; Greenfield's case, the account of which is given at length in the Further Report; and those of Zimmermann and Yannet, of Ferraro and Scheffer, of Benn, and of Lechelle. Each of these has recorded in much the same language, besides the congestion and the

Medical Diary

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

TUESDAY, Feb. 2nd.—5.30 P.M., ORTHOPÆDICS. (Cases at 4.30 P.M.) Cases: Mr. P. B. Roth: 1. Bone Graft of Radius in a Child. Mr. W. H. Ogilvie: 2. Osteomyelitis of the Pubis. Mr. R. Marnham (for Mr. E. P. Brockman): 3. Case for Diagnosis. Mr. Alan Todd: 4. Non-union of Upper Epiphysis of Femur in a Child. Mr. B. H. Burns: 5. Case for Diagnosis. 8 P.M., PATHOLOGY. Laboratory Meeting at the Pathological Department, Cancer Hospital, S.W. Communication: A. Piney: Blood Changes in Chronic Myeloid Leukæmia after Irradiation. Communications and Demonstrations: A. Piney: Megakaryocytes in the Peripheral Blood. 2. Blood Films from Case of Acute Aleukæmic Lymphadenosis. 3. Adamantinoma of Pituitary. Miss L. M. Hawksley: Adamantinoma of Tibia. W. V. Mayneord and I. Hieger: 5. Fluorescence of Cancer-producing Pitch Fractions and Hydrocarbons. Cancers Produced by 1:2:5:6-dibenzanthracene. J. W. Cook: 5:6-cyclo Pentene-1:2-benzanthracene, a new Cancer-producing hydrocarbon. Harold Burrows: 7. Localisation of Colloidal Dyes. Miss Barry: 8. Experimental Production of Sarcoma. J. M. Woodburn Morison: 9. Radiograms.

WEDNESDAY.—5 P.M., HISTORY OF MEDICINE. Papers: Dr. J. F. Halls Dally: Milestones in the History of Blood Pressure. Dr. Dan McKenzie: Alfred Higginson and the Enema Syringe (illustrated by slides and exhibits). 8.30 P.M., MEDICINE, SURGERY. Special discussion on Diagnosis and Treatment of Abscess of the Lung. Openers: Dr. R. A. Young and Dr. James Maxwell, Medicine; Mr. J. B. Hunter, Dr. Peter Kerley, and Mr. V. E. Negus, Surgery. Other speakers will take part.

THURSDAY.—8 P.M., TROPICAL DISEASES AND PARASITOLOGY. Laboratory meeting at the London School of Hygiene and Tropical Medicine, Keppel-street, London, W.C. Exhibits: Dr. Crowden: 1. The Measurement of Skin Temperature and Radiation by Means of the Moll Thermopile. 2. The Katto High Temperature Thermometer for Use in the Tropics. 3. The Early Detection and Measurement of Deafness . Leeson: 4. Specimens Illus- and Method of Breeding of *xus*, the Vector of American Trypanosomiasis. Dr. Duncan: 5. Fungi Causing Mycetoma. Prof. J. G. Thomson: 6. Animal Experiments on the Effect of Relapsing Fever on Trypanosomiasis (*T. rhodesiense*). Dr. Newham: 7. Specimens from the Museum of the London School of Hygiene and Tropical Medicine. Dr. V. B. Wigglesworth: 8. The Effect of Oil on the Tracheal System of the Mosquito Larva. Dr. Andrew Robertson: 9. *Ditrichomonas ovis* nov. sp. Found in the Gut of a Sheep. Major Edge: 10. Vital Records in Tropical Countries. Dr. N. Hamilton Fairley and Dr. P. Manson-Bahr: 11. Post-mortem Specimen of Multiple Amœbic Abscess Involving Right Half of Liver with Compensatory Hypertrophy of Left Half. Exhibits by the staff of the Department of Helminthology of the School.

FRIDAY.—10 A.M., OTOLOGY. Papers: Mr. W. S. Thacker Neville: Aural Vertigo. Mr. J. S. Fraser: The Pathology of Deaf-mutism (with lantern slides). Dr. Kerr Love: Towards the Prevention of Deaf-mutism—a Review of Forty Years' Progress. Other speakers: Mr. F. W. Watkyn-Thomas, Mr. A. Tweedie, and Mr. F. Brayshaw Gilhespy. 5 P.M., LARYNGOLOGY. (Cases at 4 P.M.) Discussion: Common Colds and Their Sequelæ. Openers: Sir Thomas Horder, Sir StClair Thomson, and Dr. J. Freeman. Cases and Specimens will be shown. Members of the Sections of Disease in Children, Epidemiology and State Medicine, and Medicine are specially invited to attend. 8.30 P.M., ANÆSTHETICS. Paper: Dr. Bernard Hollander: Hypnosis and Anæsthesia.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, W.C.

MONDAY, Feb. 1st.—5 P.M., Mr. J. P. Hosford: Some Factors in the Causation of Hydronephrosis. (Hunterian Lecture.)

WEDNESDAY.—5 P.M., Mr. R. T. Payne: Excretion Urography. (Hunterian lecture.)

FRIDAY.—5 P.M., Dr. Remington Hobbs: Puerperal Sepsis, with an account of the Treatment of Puerperal Infection by Glycerin Drainage. (Hunterian lecture.)

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, Feb. 1st, to SATURDAY, Feb. 6th.—MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W. Wed., 4 P.M., Major Meurice Sinclair: Fractures of the Lower Limbs. (Treatment serie— PRINCE OF WALES'S HOSPITAL, Tottenham, N. Dem stration by Dr. L. R. Yealland, at 2.30 P.M. on Th —LONDON TEMPERANCE HOSPITAL, Hampstead-r N.W. Demonstration by Mr. Herbert J. Paterson 2.30 P.M. on Thurs.—CHILDREN'S HEART HOSPITAL, West Wickham, Kent. 10.30 A.M. to 12 noon, Dem stration of Rheumatic Infections and Heart Dis in Children by Dr. Bernard Schlesinger.—CHELS HOSPITAL FOR WOMEN, Arthur-street, S.W. Po graduate Course in Gynæcology. All day.—ST. JOHN'S HOSPITAL, Leicester-square, W.C. Post-graduate cou in Dermatology. Clinics at 2 P.M. and 6 P.M. Lectu on Tues. and Thurs. at 5 P.M.—ROYAL FREE HOSPITAL, Gray's Inn-road, W.C. Antenatal demonstration Dame Louise McIlroy on Fri. at 5 P.M.—Furt particulars from the Fellowship of Medicine.

NATIONAL HOSPITAL, Queen-square, W.C.

MONDAY, Feb. 1st.—2 P.M., Dr. Riddoch: Out-patie Clinic. 3.30 P.M., Dr. Denny-Brown: Spasticit, Decerebrate Rigidity, and Allied Conditions

TUESDAY.—2 P.M., Dr. Walshe: Out-patient Cl Dr. Graing

WEDNESDAY.—

THURSDAY.—2 P.

3.30 P.M., D tion of the Cord.

FRIDAY.—2 P.M., Dr. Adie: Out-patient Clinic. 3.30 P.M., Mr. Elmquist: Demonstration of Re-educat Exercises. (In Exercise Room.)

GUY'S HOSPITAL, London Bridge, S.E.

MONDAY, Feb. 1st.—5 P.M., Prof. H. A. Harris: The U of X Rays in Physiological Investigations.

ROYAL NORTHERN HOSPITAL, Holloway-road, N.

TUESDAY, Feb. 2nd.—3.15 P.M., Mr. McNeill Love: Pres Position of Surgery in Tuberculous Conditions.

HAMPSTEAD GENERAL AND NORTH-WEST LONDON HOSPITAL.

WEDNESDAY, Feb. 3rd.—4 P.M., Mr. S. Boyd: Demonstra tion of Surgical Cases.

CITY OF LONDON MATERNITY HOSPITAL, City-road, E.C.

THURSDAY, Feb. 4th.—5.30 P.M., Mr. H. Burt-White Puerperal Infections.

ROYAL HOSPITAL FOR SICK CHILDREN, Glasgow

WEDNESDAY, Feb. 3rd.—4.15 P.M., Mr. A. McLennan Surgical Cases.

CENTRAL LONDON THROAT, NOSE, AND EAR H PITAL, Gray's Inn-road, W.C.

FRIDAY, Feb. 5th.—4 P.M., Mr. A. Ryland: Œsophagosc

ST. PETER'S HOSPITAL, Henrietta-street, W.C.

WEDNESDAY, Feb. 3rd.—3 P.M., Mr. F. J. F. Barringt Symptoms and Diagnosis of Carcinoma of the Prosta

ST. MARK'S HOSPITAL, City-road, E.C.

THURSDAY, Feb. 4th.—4.30 P.M., Mr. J. P. Lockh Mummery: *The Treatment of Internal Piles.*

UNIVERSITY COLLEGE HOSPITAL MEDICAL SCHO University-street, W.C.

TUESDAY, Feb. 2nd.—5.15 P.M., Dr. E. W. Fish: Pathol of Dentine and the Dental Pulp.

CHARING CROSS HOSPITAL MEDICAL SCHOOL.

SUNDAY, Jan. 31st.—10.45 A.M., Dr. F. H. Young: Chro Pulmonary Diseases in Children. 11.45 A.M., Mr. C Marshall: Disturbances of Micturition.

KING'S COLLEGE HOSPITAL MEDICAL SCHC Denmark-hill, S.E.

THURSDAY, Feb. 4th.—9 P.M., Dr. E. ff. Creed: Treatr of Septicæmia.

BEDFORD COLLEGE, Regent's Park, N.W.

WEDNESDAY, Feb. 3rd, and following three Wednesday 5.15 P.M. (in the Physiological Department), Prof. Cowell: Modern Aspects of Nutrition.

ROYAL INSTITUTE OF PUBLIC HEALTH, 37, Ru square, W.C.

WEDNESDAY, Feb. 3rd.—4 P.M., Dr. D. M. Connan: S Burden of Rheumatic Disease.

SOUTH-WEST LONDON POST-GRADUATE ASSOC TION, St. James' Hospital, Ouseley-road, Balham.

WEDNESDAY, Feb. 3rd.—4 P.M., Mr. J. Swift J Retention.

LONDON SCHOOL OF DERMATOLOGY, St. John's Hosp 49, Leicester-square, W.C.

TUESDAY, Feb. 2nd.—5 P.M., Dr. S. E. Dore: Affec of the Hair and Hair Follicles.

THURSDAY.—5 P.M., Dr. J. A. Drake: Urticaria.

ST. MARY'S HOSPITALS, Manchester.

FRIDAY, Feb. 5th.—4.15 P.M. (at the Whitworth-s West Hospital), Dr. C. P. Lapage: Diseases Abnormalities of the New-born Infant.

FACULTY HALL, St. Vincent-street, Glasgow.

TUESDAY, Feb. 2nd.—4 P.M., Prof. G. B. Fleming: I Feeding.

OTHER INFECTIONS.

e cannot pass without remark the occurrence iro-paralysis in persons who have undergone the ur treatment after being bitten. These disorders e nervous centre, recognised since the beginning tirabic treatment, are rare and do not appear attributable to the rabies vaccine. The lesions ir to be quite similar to those of post-vaccinal halitis, as Basson and Grinker,[48] among others, shown in a fatal encephalopathic rabio-vaccinal

ntion has also been made of cerebral complica- following scarlatina, whooping-cough, diphtheria,

Acute Disseminated Encephalitis.

ie title and description of this condition date the work of Westphal (1872).[49] Further est in it has recently been stimulated by the that all the post-infectious types of encephalitis ld be classed according to their clinical and omical characteristics as special types of acute eminated encephalitis. Acute disseminated phalitis has recently occurred rather in an emic fashion, though it has seemed to arise itaneously and not by any known infectious lition. Consequently there is a special interest considering these cases in relation to theories ost-vaccinal encephalitis.

tedlich,[50] in 1927, published 13 cases, discovered r a period of three years. Those attacked were the greater part adults of over 30 years of age were attacked during the winter months. All them were restored to good health. In the same r, Pette reported 25 similar cases occurring at mburg (cited by Flatau [51]). Flatau records 17 served cases collected at Warsaw and in other ns during the first half of 1928—an epidemic ies of cases with similar symptoms and certain culiarities. Children and young persons were st frequently attacked. The progress of the ease was benign, and there were only two deaths. e clinical characteristics enabled the condition to identified with disseminated encephalitis. stological examination in the only autopsy confirmed e clinical diagnosis. Analogous observations have en published by Brain and Hunter (1929),[52] artin (1928), Spiller (1929), Strauss and Rabiner 930).[53]

McAlpine [54] has recently given a detailed clinical cture and account of the lesions in acute disseminated cephalitis, taking earlier work and deductions into count. He adds a set of four occurrences of sequelæ hich were more or less severe. An apple of discord here thrown among the neurologists; multiple lerosis presents, although rarely, a form characterised y its rapid evolution and a general dissemination f the morbid process (Cournand); and the question as arisen whether this variety should be fused with he other forms of disseminated encephalitis or hould remain in its separate place. McAlpine takes he second view: that acute multiple sclerosis and lisseminated encephalitis, in spite of their similarities, lepend on different viruses. On the other hand, ournand, in his detailed monograph on acute sclerosis.[55] regards *their identity* as proved by the imilarities of the histological lesions with those which have been established for disseminated encephalitis, whether post infectionem or spontaneous. Two personal observations, with sections and reference to Pette's cases, supported this identification of multiple sclerosis and disseminated encephalitis.

Conclusions *of* Part II.

Practically all the authors cited accept, more or less, the doctrine of unity: that one type of virus only is the cause of acute disseminated encephalitis, whether it is deuteropathic (post-vaccinal or post-infectious) or protopathic (spontaneous). This virus, which it has not yet been possible to isolate or handle, must in essence be characterised by its elective affinity for the myelin sheath which undergoes disintegration (demyelinisation). It acts by itself in spontaneous encephalitis, whereas in those following infections it comes into action in the wake of another virus—vaccinia, measles, variola, varicella, &c.—which open the way for it, or enable it to pass from a latent condition to one of infectious activity.

One can no longer refuse the admissibility of this hypothesis, since it is justified by so considerable a dossier of well-established facts and nearly all writers entertain it. Some of them consider the hypotheses of identity as highly probable and others (like Pette, Perdrau, Cournand) definitely assert it. The facts brought forward to support it are certainly striking, although it must be admitted that there are also some discordances to consider. The following may be mentioned:—

(1) While post-vaccinal encephalitis is of recent date, forms of encephalitis post infectionem have long been known, some of them for over a century. The same applies to acute disseminated encephalitis.

(2) The frequency of post-vaccinal encephalitis is much greater, in the countries affected, than is that of post-infectious or disseminated encephalitis. It seems, however, that cases of the latter may be on the increase.

(3) No concomitance in time and place among these different forms of encephalitis has been observed; the post-vaccinal series are not accompanied by cases of disseminated or post-infectious encephalitis, or vice versa. In the Dutch centres, for example, encephalitis was only found among those who had been vaccinated, and not at all among those associated with them.

(4) A relatively constant period of incubation, which is shown in the post-vaccinal cases, is not evident in post-infectious encephalitis. It may be, however, that we have not yet sufficient numerical data on this matter.

(5) The fatality is much higher in post-vaccinal encephalitis than in the others. Disseminated encephalitis is, indeed, conspicuous by its benignity.

(6) Post-infectious and disseminated forms of encephalitis are often followed by sequelæ, whilst in the post-vaccinal these are very much rarer.

(7) The anatomical similarity is not in all respects complete. In addition to the perivascular infiltration and the demyelinisation, one meets with different somatic lesions, such as signs of intense inflammation and hæmorrhages, particularly in the case of the post-infectious encephalitis.

It may be that some of these differences will be effaced as observations continue and increase. The materials are scanty owing to the relative rarity of all these kinds of encephalitis; cases still go undetected, and very few are observed throughout their course and completed by autopsies.

Direct proof of the existence of a single virus for all these forms of encephalitis—one which would remove all doubts—has still to be furnished and may be long in coming. The conception of unity rests on the identity of the lesions, and is based on the myelin proof. On the other side, it may on principle be urged that the same histological process can be engendered by diverse infections, by diseases which are very different in respect of their ætiology. The histological proof in itself is hardly sufficient to carry full conviction. But if in place of unity one assumes *plurality of the viruses*—that is to say, that each encephalitis, post-vaccinal, morbillar, varicellar, variolous, &c., is due to its own virus which, as the result of its neurotropism, has succeeded in attacking the nervous centres—one has then to ask if it is reasonable to suppose that so many different viruses would attack the nerve tissues in the same manner, with the same localisation, the same selectiveness, and the same microscopic characteristics.

The assumption of a single encephalitogenic virus which is associated with the different viruses of these diseases followed by nervous complications seems to be in more logical accord with the facts known up to now. It is, however, simply a *provisional synthesis* resting at the mercy of scientific progress, which, by confirmation or invalidation, will give us better and surer conceptions. These we must be ready to entertain without tying ourselves to preconceived opinions.

At least the main lines of the problem have now become clear and fruitful results have been obtained hæmorrhage, a perivascular infiltration, though often very slight, and a typical demyelinisation.

SMALL-POX.

The series of encephalitis cases following small-pox which have been recently recorded are few in number. Nevertheless, knowledge of nervous sequelæ of small-pox dates back for two centuries. Reference is made to them, according to Greenfield, in the writings of Clifton (1724) and Freind (1730) and they have also been observed as following variola inoculation (Dunsdale, 1757) (communication by Dr. Hutchinson). This detail suggests that small-pox inoculation could cause cerebral infections in the same way as cow-pox; nevertheless, even at this distant epoch, if encephalitis complications had been prevalent epidemically among small-pox patients as is the case to-day among vaccinated persons, the circumstances should have been known and recorded. More recent writers recall this occurrence of nervous complication; and among them MacCombie (1905) states that in small-pox the nervous system is more often involved than is the case in other eruptive fevers (cited by Troup and Hurst [33]). Rolleston only found 25 examples out of 10,000 small-pox cases in London in the epidemic of 1901–02.

During the five years 1925–29, 23 cases of death from small-pox accompanied by various nervous complications have been registered in England, and some of these were definitely diagnosed as encephalitis. In two of them the encephalitis was duly confirmed; McIntosh and Scarff described a case of encephalitis following small-pox in 1928, and another, in a man of 63 years, was given by Troup and Hurst.[38] A third case is noted in the Further Report. In all these there was similarity in the clinical facies and identity in the histological findings—a cellular infiltration around the vessels and zones of disappearance of the myelin sheath.

A curious case was cited in the Further Report. A boy vaccinated six days previously fell ill with small-pox; two days after the rash cerebral symptoms appeared but he eventually recovered. It is not clear whether the encephalitis should here be put to the account of vaccinia or variola.

The Ministry of Health has unpublished notes concerning four cases, one of which is interesting, not only because of the age of the patient, 63 years, but because of the precocity of the nervous symptoms which preceded the small-pox eruption by two days. It should be noted that encephalitis can occur in variola minor as well as in variola major; as in the case of measles, it does not depend on the severity of the disease. Nervous complications in the case mentioned in the Further Report arose four days after the onset of small-pox; in the Troup and Hurst case the period was 12 days. In that particular case small-pox ran a normal course in 15 other persons who had been infected from the same source.

VARICELLA.

Encephalitis after varicella has been described by various observers, though cases are not common. In 1924–25 Toni and Galli drew attention to this complication of varicella. D.W. Winnicott and N. Gibbs (1926) and Glanzmann (1927) [39] brought forward some new cases, and the latter considered their pathogenesis. Wilson and Ford [40] in 1927 recorded three histories all ending in complete recovery.

Bertoye and Garcin in 1929, Robert Rendu in 1930, and P. Gauthier in 1931, recorded similar cases (cited by Comby [34]).

Rake [41] described a very clear case in connexion with which he makes a survey of known literature. Tramer [42] also records a case with encephalitic symptoms. Eight cases have been recorded by the English Ministry of Health, all in infants below 5 years of age. Bouman has recently mentioned a case after varicella which he considered quite characteristic, followed by recovery, in a child of 4 years of age who had never been vaccinated (communication of Dr. Jitta). Babonneix [43] attrib to encephalitis the convulsive attacks of Jacks type which occurred in two infants with varic He also mentions another case, also after varic with complication of symptoms. The period o incubation is said to vary from five days from the appearance of the rash to 15 days and even mo The prognosis is quite favourable. There have b no autopsies, so that the diagnosis of typ encephalitis can only be assumed.

MUMPS.

It has long been known that epidemic parotitis can be accompanied by meningo-encephalitic phenomena Acker, in 1913, was able to collect 30 fatal cases, and several came to light during the war. Bedfield (1927) [44] described a case, and refers to prev literature on the subject. K. Holtz has (1931) giv an account of another case with meningeal sympto occurring two days after the swelling of the rig parotid, and has collected 16 fatal cases since 191 A benign form would appear to be usual in children the condition seems to be more severe among adults

The cerebral manifestations occur after the swelling of the parotid, though it seems that sometimes they may precede the appearance of the parotitis. No deaths and no autopsies.

GERMAN MEASLES.

Pierret and Le Marc'Hadour [45] in July, 1931 described to the Société de Médecine du Nord a case of meningo-encephalitis occurring during mild measles with death after 36 hours. A similar case had been described by Brock [46] in 1929. Debre Turquéty, and Broca [47] also dealt with this type c encephalitis in 1930 on the basis of two observations In both, though the affection was well-marked recovery was rapid. Babonneix [43] described a ca following rubeola accompanied by diffuse lesions the nervous system and terminating fatally after protracted development.

No autopsies have been recorded which wou determine the precise nature of the affection.

INFLUENZA.

In influenza we have a virus endowed with selective affinity for the nerve centres. Po influenzal encephalitis occurs more or less frequen during the course of the great pandemics of influen and also during the ordinary seasonal recrudescenc So well was this realised that at the time t encephalitis lethargica made its appearance, it w considered natural to regard it as dependent on t universal influenza epidemic of 1918. The Briti statistics record 99 fatal cases during the peri 1927–30, the great majority being adults.

Much has been written on post-influenzal encepha myelitis and its lesions, but what interests us for t moment is to know whether from recent autops it has been possible to discover histological lesio similar to those of post-vaccinal encephalitis. cases in adults, studied by Greenfield, were publish in the Further Report; one was fatal five da and the other seven weeks, after the appearance the encephalitis. The post-mortem examinati revealed the same lesional picture as in encephali following other infections—cellular infiltration rou the vessels with concomitant demyelinisatio McAlpine was of opinion that the second case w one of idiopathic encephalitis rather than due influenza. One might, however, consider it mo probable that a light and simple infection, su as an angina, a cold, or bronchitis, can origina the encephalomyelitis, whether influenzal or n (G. Buchanan, Report of the Small-pox Committe 1930).[3]

Influenzal encephalitis in the light of the earli reports appears to be of a complex and variab nature. The vascular lesions—congestion ar hæmorrhage—are very pronounced, and the inflam mation may even at times become purulent.

raft of goldsmiths and other workers must use fire. How they shall deal therewith and drive he poisons.

e skilful, subtle and noble craft of Goldsmithery of perial City of Augsburg.

willing devoted service be ready for you all. As h Ellenbog, Doctor of Physick, of Feldkirch, now an to the Dean and Chapter of Augsburg Cathedral, bserved the great, severe and remarkable harm o this skilful craft cometh through the fumes and s of the things wherewith the said craft hath to so I could not withhold or refrain from giving advice service and help of the craftsmen, that they come such grievous harm or disease through these fumes. pray you, masters and men, that ye take in all good nd friendship this my little advice, written with own hand, then the readier will I be with friendly s to you each and all who command and work. at Augsburg the 6th day of October, 1473.

he fire of coals.—In your subtle craft ye use coals for e. The smoke or vapour of the same is poisonous articularly if the coals be somewhat damp, for this r burdeneth the head and also the chest, especially if e near it for long, and when one tarrieth there too the sight waxeth dim, so that it seemeth as if there be and blue and such like before his eyes, or flies in the This vapour also maketh heavy, unnatural sleep and nes heavy limbs, and if one be therein for long he neth palsied. Therefore burn not much damp coal, kindle in the open air. In winter time when ye have fire in the workshop, shut not the windows and guard selves from this vapour so far as ye may, is my advice. writings shew that it is quite poisonous and deadly to nd sleep for long in a closed room with this coal-vapour. any masters in physick prove this, for brevity's sake it eth not be pointed out. If ye craftsmen will use coal first kindle and blow them up in the open air, then white incense therein or sprinkle a little wine thereon. ill the poison and harm of this vapour be lessened.

the vapour of quicksilver, lead and other metals where- goldsmiths do use to work.

he writings of physick hold that the vapour of every g retaineth the nature, complexion and power of the y whence it issueth. Wherefore are the apothecaries t to make distilled waters that are of a hot nature when take hot herbs, and from cold herbs they distil cold ers. Wherefore is it also that the smoke or vapour of a metal retaineth the complexion, nature and power he metal wherefrom it issueth. And often the vapour moke is stronger, mightier and sharper than his mineral, al or body, as one manifestly seeth if one sublimate a fortis, also if one distil brandy, for the vapour is much nger than the sal ammoniac alone, etc., or also the wine erefrom the brandy is made. Wherefore men call and ne the vapour spirits, that is ghosts, for through their rpness, strength and subtlety, they always penetrate l work more strongly than the body wherefrom they drawn. Now it is apparent in the writings of nature that icksilver is right cold and wet in his complexion and also ion, also that lead is cold and wet, likewise that silver of a cold nature, likewise litharge and antimony are cold. herefore I say that the smoke and vapour of the said etals chilleth greatly the man who hath to work therewith. herefore when ye masters and men work silver with lead, gild, ye shall guard yourselves as far as ye may from the pour and smoke, for it is poisonous to you, and it is my lvice that ye do it in the open air with all diligence, and ot in a closed room. Also ye shall not bend too much er this vapour but turn away therefrom and bind up the outh. This vapour of quicksilver, silver and lead is a ld poison, for it maketh heaviness and tightness of the est, burdeneth the limbs and ofttimes lameth them as ten one seeth in foundries where men do work with large asses and the vital inward members become burdened herefrom.

How One Shall Lessen and even Turn Aside the Harm of these Vapours.

Dear masters and men, when ye refine or gild, have musk y you, and ye shall smell of this much and often, for the apour of the musk quelleth and suppresseth by his warmth he coldness of the smoke from silver, lead and quicksilver. Also the musk, by the property that it hath of strengthening he vital members of the heart and brain, wardeth off and ssuageth the harm from the vapour of lead and quicksilver, therefore the same vapour cannot harm you so. Likewise what time ye goldsmiths be in the aforesaid fumes, keep *in* your mouths one of the following pieces, which ye will, and chew it, so by the strength of these pieces will be corrected and lessened the poisoning of the vapour that ye draw in with the air for your breath. Thus the said vapour cannot so harm you as if ye held not the pieces or their like in your mouths. And these are the pieces: juniper berries, rue, dittany, that is a pure white root, tormentil, elecampane.* Many other pieces are commended by the physicians against these poisonous vapours, but these aforesaid seven pieces are good for you, also common enough that ye and everyone can get them at small cost. Some teachers of physick highly commend the emerald, which one shall also hold in the mouth, for it withstandeth the poisoning of this vapour. Also, dear craftsmen, if one of you in gilding or refining hath inhaled much vapour, so that he feeleth distressed or feareth harm, he shall on the morrow, fasting, sweat in bed and then take a good old theriac such as a large hazelnut with rue-water or speedwell-water or wine, thus will the poisoning be driven out of him, which hath entered him in refining or gilding. The doctors also recommend that ye shall after refining or gilding drink wormwood wine, for by the warmth and heat of the wormwood the chilling of the said vapours will be suppressed. Moreover wormwood hath the property that it withstandeth the poisoning. And he who hath no wormwood wine in his cellar may in a day or seven hours make it by dropping wormwood into wine. If however one cannot sweat in bed, he shall go on an empty stomach to the bathroom and take the theriac as before directed.

Against the vapours of aqua fortis which are warm, hot and right sharp, and against the vapours of litharge and antimony, which are of a cold nature, ye shall guard yourselves specially well as is described above for lead and quicksilver. Also some teachers say one shall eat garlic before and after against suchlike poisonous vapours.

Against the vapours of verdigris, saltpeter, and sal ammoniac guard yourselves right well because when ye fire pale gold, then these vapours are very hot, sharp and poisonous. To correct and lessen their poisoning thou shalt drink half a dram of bole mixed with wine and rosewater. Herewith God keep us all sound. Amen.

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HYPODERMIC NEEDLES OF BRITISH MANUFACTURE.

WE have received from British Surgical Industries, Ltd., 14, Regent-street, London, samples of their hypodermic needles in stainless steel with gold finished mounts. These are also made in the finest quality of Sheffield steel with silver finished mounts. The specification of the needles supplied to us is size 15, 28 mm., bore ·37. The aim of the firm is to supply the profession with dependable articles at lower prices than are now charged for those of foreign origin.

A PHOTOGRAPHIC RECORD OF RADIUM CASES.

THE radium workers at the Middlesex Hospital have conceived the interesting idea of publishing a photographic record of some of their successes and failures.[1] As they point out in their preface, radiotherapy is in its infancy, and a record of the results obtained at this stage may prove of great value in the future. The bulk of the book consists of very beautiful untouched photographs of superficial malignant growths before and after the application of radium. The cases are classified as carcinomata (squamous-celled, basal-celled, spheroidal-celled), sarcomata, and miscellaneous (lupus vulgaris, lupus carcinoma, and odontoma). Each photograph has a by pursuing them. It is greatly to be hoped that they will be pursued; that, on the one hand, the investigators will persevere in the study of experimental encephalitis and, on the other hand, that the course of post-infectious and disseminated encephalites will be closely followed. All these studies should be vigilantly watched. They already come under official supervision in England, Holland, Germany, Sweden, and elsewhere. Medical practitioners should notify any cases recorded by them in order to obtain an examination by an expert neurologist, laboratory determinations, and, in fatal cases, a post-mortem examination by an expert in the pathology of the nervous system. The Ministry of Health in England has recently addressed to practitioners a request that they will communicate without delay all cases with acute infection of the central nervous system which have occurred within four weeks after vaccination, or in which the symptoms have immediately followed an acute infectious disease. All such collections of carefully made observations will bring us nearer to wider and exacter knowledge.

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* Two others are mentioned, which I have been unable to identify.—C. C. B.

[1] Some Radium Cases at the Middlesex Hospital: A Photographic Record. By A. Cameron Macleod, M.B., B.S., F.R.C.S. The Middlesex Hospital Press. John Murray, 1931, pp. 154, 7s. 6d.

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SALE AND PURCHASE OF PRACTICES.

WE have received from Mr. Percival Turner a little volume which is a partial reprint of the "Guide to the Medical and Dental Professions" which he wrote some years ago and which is now out of print. These "Hints," as the author terms his excerpts, relate particularly to the sale and purchase of medical and dental practices and partnerships, and include much information given in the previous publication, when it remains relevant to existing circumstances. We may draw attention to the fourth chapter which sets out the circumstances for the employment of assistants and locum-tenents, for every practitioner knows there are many difficult positions that may arise in these relations, such as the death or bankruptcy of the principal or the employee, the failure of one or other party to keep the terms of the contract, the misunderstanding of agreements for special services, travelling expenses, and so on. Mr. Turner gives wise counsel on these and analogous points out of his long experience.

PROBLEMS OF WATER POLLUTION.

FOUR years ago the Water Pollution Research Board of the Department of Scientific and Industrial Research began to issue a monthly series of abstracts on sewage, water-supply, and pollution. In the Board's latest report * Sir Robert Robertson remarks that these are stimulating industrial concerns and individuals to carry out experimental work on their own problems. The first number of the new volume of 123 abstracts † contains a note on the hygienic control of public baths in Greater Berlin, the water of which is required to be clear, to be free from the colon bacillus in 100 c.cm., and to contain not more than 200 bacteria per c.cm., the content of free chlorine being not less than 0·1 and not more than 0·5 parts per 1,000,000. The replacement of chlorination by treatment with copper or silver (whether or not in the form of catadyn is not stated) was tried in some cases, and copper alone was found to reduce troubles from slime. Swimming-bath conjunctivitis has not appeared in these baths for some years. In another note it appears that the water-supply of Los Angeles is so critical that the reclamation of sewage has been investigated. We are familiar with the necessity of using a circulating system for the water-supply of many modern country bungalows, but the possibility of converting sewage into a normal supply of drinking water goes far beyond this. It seems to be proposed to maintain the ground-water level in this way.

ULRICH ELLENBOG.

REFERENCE was made in THE LANCET (1931, ii 809 and 997) to a fifteenth century treatise o industrial hygiene mentioned by Dr. L. Caroz in his historical review of occupational disease It may be of interest to note that this was reprint in facsimile in 1927 [2] from the only known copy the first issue in Munich University Library. copy of this reprint is in the library of the Lond School of Hygiene and Tropical Medicine. Preced the facsimile is an account, by Friedrich Zoe based on his longer article,[3] of the life and work Ulrich Ellenbog (not Ellembog, as Dr. Carozzi sp it). The name is probably derived from Ellenbo in Vorarlberg, Austria, about 30 miles east of Ulric birthplace, Feldkirch. He was educated at universities of Vienna, Heidelberg, and Pavia, gradu ing as Doctor of Medicine at the last named in 1 He then returned to his home town of Feldki Later he occupied an official position as physi to the Cathedral in Augsburg, where his trea was written. He was a devoutly religious and paid particular attention to the religious educa of his 11 children, four of whom later entered service of the Church. He died in 1499. Thre his works were printed, four are known onl manuscript, while five others are lost. A account of the present pamphlet from the me point of view has been provided by Franz Koe who claims for it the distinction of being the work on industrial hygiene in the literature of world. A typographical study follows from the of the editor, who concludes that although the was written in 1473 it was not printed till by Melchior Ramminger in Augsburg.

Since the reprint itself is not easily accessible, Ellenbog's fifteenth century Swabian is not easy reading as modern High German, Mr. Barnard, Librarian of the London School of Hy and Tropical Medicine, has made a translation o text; this occupies only eight small pages in original, and the translation is complete.

THE TREATISE.

On the poisonous evil vapours and fumes of m such as silver, quicksilver, lead, and others tha

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* Report of the Water Pollution Research Board. Stationery Office. 9*d*.

† Summary of Current Literature. Ibid. 2*s*. Annua scription 24*s*. post free.

ADDRESSES AND ORIGINAL ARTICLES

HE ÆTIOLOGY OF CARCINOMA.

J. M. SHAW, M.C., M.D., F.R.C.S., F.R.S. EDIN.,
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LECTURER IN SURGERY AND ASSISTANT TO THE
PROFESSOR OF SURGERY IN THE
UNIVERSITY OF EDINBURGH.

(Concluded from p. 224.)

Chronic Irritation.

HE phrase "chronic irritation" is given so much nence that it must be assumed to convey a ise scientific meaning to many minds, and it has distinction of being the oldest hypothesis of the e of cancer. Perchance some of you have felt, . have, that the connotation of the words is so ce that they are not helpful in dispelling the ts which obscure our vision. "Tar, jagged teeth, ses and that sort of thing," as they were once mplified to me, will not carry us sufficiently far ng the road and may even prove a stumbling-block. he connotation of the term is felt to be vague, it oves us to remember the precept from Logic that, scientific use, the connotation of a term is determined by and is the same as its definition, and to carry the instruction that the definition is determined examining the things to be denoted.

Leitch has pointed out that few of the substances ich we might call tissue irritants are capable of ucing tumour growth, just as out of the myriads of ds of bacteria there are relatively few which are initely pathogenic.[15] Greenfield states: "If we gard the processes of irritation as a whole, we find all of them a series of reactions combined for the mmon object of removing or antagonising the itant and of preventing and repairing damage."[19] The persistent manifestation of the process of pair" has been described as the effect of the chronic itant, and the general conception is the "response y proliferation and increased cellular activity to the resence of something which is foreign to the cells of he body."[20]

It should be stated here that the conversion of a roup of cells of normal type into those with the ppearance and properties of carcinomatous cells is not necessarily followed by the establishment of a arcinoma. Two further stages are necessary. The ell must irrupt from its natural locus as an epithelial unit and, further, it must be capable of surviving this critical transfer and multiplying in the tissues of the host. Cheatle has ably emphasised this point, and frankly states his belief that the altered cells lying within the ducts of the breast are, in fact, cancer cells in form and metabolism, although they have not yet secured ingress into the connective tissues of the host.[21] He and Fraser[22] have succeeded in obtaining microscopical demonstration of this stage in the life-history of the cell. The problem then comprises these three stages of conversion, transfer, and multiplication, of which conversion is the most important in relation to ætiology.

Action of the Irritant.

In attempting to impart a precise meaning to the phrase "chronic irritant" I would like, in the first place, to draw your attention to the action of an irritant upon an epithelial surface. This has been described in masterly *fashion by Lewis in his work* on the "Blood-vessels of Human Skin and their Responses."[23] A triple response is shown on the application of a stimulus, mechanical or chemical, to the skin surface, the stages being first a local vaso-dilatation, second the "flare" or spreading flush, and third, a local œdema. By this means the chemical irritant with the histamine substance which it has evoked are diluted and neutralised and finally carried away from the site of irritation in the blood and lymph channels. Many examples of this rapid reaction could be cited. The application of formic acid illustrates it well.

Instead of a single sharp application of the chemical irritant, I would ask you to visualise the effect of such a stimulus if very much prolonged. In such circumstances a strong irritant would, of course, produce necrosis. With a weak irritant, however, a highly important series of changes occur which have a definite bearing on the question of carcinogenesis. For the recognition of these changes we are indebted to Kreyberg, of Oslo, whose brilliant work should command the widest attention.[24] Using tars, 5 per cent. mustard oil and the prolonged application of heat, Kreyberg has shown that there is a limit to the capacity of the minute blood-vessels to return to normal after the unduly long stimulus of an irritant. After a period averaging about five weeks in mice experiments an "ectasia" of the vessels is produced by the throwing out of gear of the local vaso-motor reflex. This dilatation remains permanent and is followed by a capillary thrombosis and an associated local connective tissue fibrosis. Respiration of the cells is interfered with by this deprivation of capillary oxygen. On account, however, of the slowness of the process, the successive generations of affected cells have time to develop that reserve method of obtaining energy which characterises all malignant tumours, namely glycolysis, in which the carbohydrates are split with the production of lactic acid. Warburg says:

> "Interference with the respiration in growing cells is, from the standpoint of the physiology of metabolism, the cause of tumours. If the respiration of a growing cell is disturbed, as a rule the cell dies. If it does not die, a tumour results."[25]

I have ventured to place the views of Kreyberg and Warburg in sequence in this way because they appear to justify this important inter-relation. It will be apparent that the vascular reactivity will be more readily deranged by the prolonged application of an irritant if, at the outset, the local blood-supply is deficient, as in many scars, or if the blood-vessels are diseased, as in tertiary syphilis. Lumière has emphasised the susceptibility of scars to the action of irritants, and the high proportion of syphilitics as subjects of buccal and lingual carcinoma is well recognised. The carcinogenic irritants are undoubtedly numerous, and we will agree with C. H. Mayo when he says: "There is no one cause for cancer; all merely contribute through their chemistry to end-results upon cell growth."[26] Kennaway, Hieger, H. M. and C. C. Twort have proceeded far in isolating some of the irritants among such of the mineral, animal, and vegetable oil groups as are carcinogenetic.

Medium of Application of the Irritant.

Now arises the fundamentally important question, "by what means is the necessary chronicity or constancy of application imparted to the irritants so that their service to the cells is continuous and prolonged?" I would answer this question by the suggestion that the responsible factor is the physical brief clinical note attached to it. There is a short history of the technique employed at the Middlesex since 1912, and each section of photographs is introduced by two or three pages of letterpress on the technique employed and the results obtained.

PRACTITIONERS' REGISTER OF DANGEROUS DRUGS.

We are informed that there is still some misapprehension about the requirements of the Dangerous Drugs (Consolidation) Regulations concerning the keeping of registers by medical practitioners who do *not* dispense or supply drugs to their patients. Every such medical practitioner who obtains the drugs for whatever purpose is, by No. 11 (1) (A) of the Regulations, required to keep a register in the form set out in the second schedule to the Regulations and enter therein true particulars with regard to every quantity of any of the drugs obtained by him at the time he obtains them.

STAINING SMEARS FOR THE MICROSCOPE.

There are many small pedantic practices which take up much time and might well be replaced by something simpler. Where for example, microscopical control is of decisive importance in diagnosis the usual plan is to take a smear and lay it by for further treatment and investigation. To simplify these operations Dr. Felice Marta,[1] of Milan, uses an ordinary copying pencil. The smear being obtained, the tip of the pencil conveys a drop of water on to the slide beside it. In a few seconds the drop is adequately coloured by the pencil, and it is then allowed to glide over the smear which rapidly absorbs the stain. When dried, the smear shows uniform staining with clear definition of cells and nuclei, transparent in the free spaces, and especially an intense colouration of the microbic elements which Dr. Marta says is more distinct than that obtained by the usual colouring agents. The make of pencil is of no importance, but its colour is; the best results are obtained by blue, violet, or green, the colour being due to acidity or alkalinity of the aniline pastel, while red and yellow show admixture with earthy substances.

INDEX TO "THE LANCET," VOL. II., 1931.

The Index and Title-page to Vol. II., 1931, which was completed with the issue of Dec. 26th, is now ready. A copy will be sent gratis to subscribers on receipt of a post-card addressed to the Manager of The Lancet, 7, Adam-street, Adelphi, W.C.2. Subscribers who have not already indicated their desire to receive Indexes regularly as published should do so now.

Appointments

Thomas, L. Glynne, L.R.C.P. Lond., M.R.C.S., has been appointed Resident Asst. M.O., Infectious Diseases Hospital, Birkenhead.

London County Council: Simmons, J. H., M.B., B.S. Lond., Assistant Medical Officer, St. Giles' Hospital; Carroll, J. V., M.B., B.Ch. Dubl., D.P.H., Assistant Medical Officer, Park Hospital; Benson, V. C., M.R.C.S., L.R.C.P. Lond., Assistant Medical Officer, Grove Park Hospital; Mowlem, R., F.R.C.S., M.B., Ch.B., Assistant Medical Officer, Hammersmith Hospital; Muir, C., M.B., Ch.B. Edin., Assistant Medical Officer, King George V. Sanatorium; Scobie, W. H., M.B., Ch.B., D.P.H., Assistant Medical Officer, Downs Hospital for Children; Evans, T. J., M.B., B.Ch., D.P.H., Assistant Medical Officer, St. Luke's, Lowestoft; Heather, J. C., M.B., B.S., Assistant Medical Officer, St. George-in-the-East; Taylor-Jones, Miss E. L., M.R.C.S., L.R.C.P., House Physician, St. Olave's Hospital; Stanley, Miss S. M., M.B., B.S. Lond., House Physician, St. Olave's Hospital; White, Miss J. E. M., M.R.C.S., L.R.C.P. Lond., Clinical Assistant, St. Mary Abbots Hospital; [illegible] B.S., Medical Superintendent, [illegible] West, H. O., M.B., B.S., D.P.[illegible] Archway Hospital.

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[1] Il Policlinico (Practical Section), Jan. 4th.

Vacancies

For further information refer to the advertisement colum

[illegible] *mary.*—Anæsthetist.

[illegible] *l.*—Jun. Asst. M.O. £

[illegible] Cas. Surgeon. £100.

[illegible] —Biochemist. £400

Birmingham and Midland Eye Hospital.—Res. Surg O

Bootle General [illegible] Hon. Dental Surg

Bradford Royal [illegible] Each at rate of £

Bristol Royal [illegible] H.S.'s to Special D Each at rate of £60. Also Cas. H.S. At rate of £1

British Institute of Radiology, 32, Welbeck-street, W.—Sub E

Cambridge, Addenbrooke's Hospital.—H.P. At rate of £1

Central London Throat, Nose, and Ear Hospital, Gray's Inn-road, W.C.—Asst. Surg. Also Third Res. H.S. rate of £75.

Dorchester, Dorset County Hospital.—H.S. At rate of £1

East London Hospital for Children, Shadwell, E.—Dermatol

French Hospital and Dispensary, 172, Shaftesbury avenue, W. Gynæcologists.

Glasgow, Harry Stewart Hutchison Prize.—£50.

Glasgow University.—Dr. Robert Pollok Lectureship in Materia Medica and Therapeutics. £500.

Grimsby and District Hospital.—H.S. £200.

Hospital for Consumption and Diseases of the Chest, Bromp S.W.—Asst. for Dept. of Path. £350.

Hospital for Sick Children, Great Ormond-st., W.C.—Cas. O. £

Hostel of St. Luke, 14, Fitzroy-sq., W.—Res. M.O. At rate of £

Kendal, Westmorland County Hospital.—H.S. At rate of £

Kettering and District General Hospital.—Res. M.O. At r of £200.

Leicester, City Mental Hospital, Humberstone.—Second A Res. M.O. £400.

Liverpool, Fazakerley Sanatorium (Tuberculosis).—Asst. M.O. £250.

Liverpool, Royal Southern Hospital.—Cas. O. At rate of £1 Also Two H.S.'s, M.O., and Res. Anæsthetist. Each rate of £60.

London Temperance Hospital, Hampstead-road, N.W.— Reg. 40 gns.

[illegible] *al.*—Two H.S.'s. Each at rate of £

[illegible] *nsumption and Diseases of the Th* [illegible] for In-patient Dept. £200.

Norwich, Norfolk and Norwich Hospital.—H.S. £120.

Nottingham Children's Hospital.—Res. H.P. At rate of

Nottingham Hospital for Women.—H.S. At rate of £150.

Oxford County and City Mental Hospital, Littlemore.— M.O. £400.

Preston and County of Lancaster Royal Infirmary.—H.S rate of £150.

Princess Beatrice Hospital, Richmond-road, S.W.—Anæstl

Queen Mary's Hospital for the East End, E.—Hon. Asst. Su and Physician.

Queen's Hospital for Children, Hackney-road, E.—Surg. to Nose, and Throat Dept.

Richmond, Surrey Royal Hospital.—Third Hon. Anæsthe

Royal London Ophthalmic Hospital, City-road, E.C.— Refraction Assistants. Each £100.

Royal Northern Hospital, N.—Obstetric H.S. At rate o

St. Thomas's Hospital.—Phys. to Out-patients.

Salford Royal Hospital.—Gen. Supt. and Sec. £600.

Salisbury, General Infirmary.—H.P. £150.

Sheffield Royal Infirmary.—Ophth. H.S. At rate of £80.

Walsall General Hospital.—Sen. Res. O. At rate of £10

West London Hospital, Hammersmith-road, W.—Non.-Res. £250. Hon. Obstet. Reg. Also Hon. Asst. Anæsthe

York County Hospital.—H.S. to Ear, Eye, Nose, and Dept. £150.

The Chief Inspector of Factories announces vacanc Certifying Factory Surgeons at Bridgend (Glam.) Framlingham (Suffolk).

Births, Marriages, and Deat

BIRTHS.

Cory.—On Jan. 20th, at Bury St. Edmunds, the wife o W. E. Cory, of a son.

Dewhurst.—On Jan. 21st, at Shawfield, Havant, the Dr. M. S. Dewhurst, of a son.

Platt.—On Jan. 23rd, the wife of Harry Platt, M.S., F of Newbury, Victoria Park, Manchester, and Ronda Prestbury, Cheshire, of a daughter.

MARRIAGES.

Taylor—Pratt.—On Jan. 14th, at Marylebone Registe Alexander Giles Cameron Taylor, M.R.C.S., L.R. Bellefields, Englefield Green, Surrey, to Norah, only d of the late A. H. Pratt, and of Mrs. Pratt, of Epsom

DEATHS.

Craven.—On Jan. 16th, suddenly, at a nursing home in Walter Craven, M.R.C.S., L.R.C.P., late of Umtali, S Rhodesia.

Hendley.—On Jan. 21st, suddenly at The Thatched Caxton, Cambridge, Major-General Harold Hendle (I.M.S., retired), in his 71st year.

Henshaw.—On Jan. 20th, at Shawfield-park, Bromle Harry Williams Henshaw, M.R.C.S., L.R.C.P., aged 63.

Shute.—On Jan. 20th, 1932, suddenly, at Granby-place fleet, Geo. Sidney Shute, M.D., aged 69 years.

N.B.—A fee of 7s. 6d. is charged for the insertion of N Births, Marriages, and Deaths.

the persistent retention of epithelial oral debris. is the evidence of disorder in the lower alimen- ract, the mildly irritant elements accumulate in ucinous film.

example means very little but will serve to explain aning. Recently a sailor of 29 years of age presented f at hospital with an epithelioma of the hard palate year's duration. He had worn dentures for five and on being asked the routine question as to their g pain he replied, "No. That is the trouble. They o comfortable that I wore them for several days and , at times, without cleaning them."

uld suggest that this adhesive, stale, slimy sub- e is worthy of consideration as a responsible r, as the retained debris of the tonsillar crypts pharyngeal recesses may also have an action upon nucosa with which it is in long contact.

the *urinary bladder*, I would refer to the only p in which an unduly high incidence is alleged— ely, the aniline dye workers. In such cases the inoma is, apparently, always preceded by a nic hæmorrhagic cystitis. The exemption of the ley in these workers may be thus explicable.

n the *lung* the association with old infected cavita- is recognised, and in the best known occupational dence—i.e., among cobalt workers—a chronic foul nchitis is stated to be very common as a precursor he carcinomatous change.

VARIOUS ADJUVANTS TO THE APPLICATION.

Burns of all types (thermal, X rays, khangri, kairo,) may be followed by carcinoma. It is, however, imperfectly healed burn or the one associated with hronic fissure or ulcer. with chronic dermatitis or atosis, which produces the condition. In such es the stagnant secretion, its irritant action inten- ied by infection, may operate for several years. e partially destroyed skin gland may continue to rete in the depth of certain keloidal burn scars, d in these a basal cell carcinoma supervenes. The ain lesson of a masterly analysis of the development cancer in burn scars by Treves and Pack from the emorial Hospital in New York is the fact that severe rn scars are so prone to break down from tension, chæmia. and trauma. and that carcinoma arises at a te stage in the persistently broken surface.[36]

Arsenic has been described as a cause of cancer. he external application of this substance has not roved dangerous. When taken medicinally over ng periods it may produce a very chronic dermatitis r adhesive hyperkeratosis. No human case is on ecord in which the carcinoma has not been preceded y such a change. While the arsenic is thus respon- ible for the chronic skin changes, it is probable that he prolonged action of the unshed skin debris is the esponsible intermediary with the same irritative action as is shown in a chronic intertrigo. For a very complete description of the late effects of the prolonged exhibition of arsenic I recommend the contribution of Pye-Smith, Nutt, and Beattie.[37]

Lupus is an accepted precursor of cancer, but again the carcinoma supervenes in those areas in which fissuring occurs. such as the angle of the nostril or around the mouth or in an isolated portion in which the disease still smoulders in raised yellowish patches which, on scraping, yield a greasy mass of cell debris and stale exudate.

In the experience of an expert like R. L. Sutton a *seborrhœic keratosis* of long standing, often the result of actinic action, is the commonest precursor of epithelioma.[38]

Roffo has produced a carcinoma on the ear of a rabbit by the application of an admixture of *tobacco* oil.[39] I have never been able to advance beyond the stage of hyperplasia in many mice experiments with this substance. The difficulty in tobacco oil experimentation is that it tends to solidify at normal temperature, like a resin. after a short time. A certain degree of oily viscosity is an essential in the medium. I would make the suggestion that this viscosity may well be maintained in the stem of a hot porous clay pipe.

The researches of Fibiger have received wide and well-merited attention. No suggestion has been made, except by Sambon, that the presence of a gross *parasite* in the tissues is in itself a cause of cancer. A large variety of parasites dwell harmlessly in this way. I would commend the suggestion of Leitch that the start of the malignant proliferation is probably due to the prolonged toxic action of some excretion of spiroptera.[40]

CARCINOGENESIS IN THE ALIMENTARY TRACT.

The alimentary tract forms, in my opinion, the outstanding example and verification of the chemical nature of the carcinogenic irritants and also, I submit, of the importance of the medium from which they act. The extreme disparity in incidence between the small intestine on the one hand and that of the stomach and colon on the other seems to be explicable only on a chemico-physical basis. In the stomach and colon the action of the irritants is intensified in an acid medium, and the tenacious mucus in these sites renders their application constant. The fatty acids are formed in great excess in the large bowel by the action of bacteria upon the carbohydrates. In conditions of chronic gastritis and of colonic stasis the disintegration and interaction products of the fatty acids acquire a toxic and irritant quality which is absent under the healthy conditions of rapid passage. Per contra, in the small intestine these acids are saponified and rendered soluble as one of the main processes of digestion and the mucus medium is emulsified and passed on quickly.

EXTRAVASATION OF BLOOD.

The action of the insoluble elements of extravasated blood, chiefly fibrin. and the lactic acid which is produced when the blood leaves its normal channels are of importance, especially in the ætiology of sarcoma. Extravasated blood would also. however, appear to be the responsible potent substance in the undoubted acceleration of growth which occurs in a carcinoma when contused or incised or incompletely removed by surgical means. By hæmorrhage into a simple tumour, as by a myxomatous degeneration, a change in the character of the neoplasm may be induced. The rapid increase in the lactic acid content has been demonstrated in blood after withdrawal from the vessels and allowing it to stand for varying periods.[41] In a series of observations upon hæmatomata, formed in rabbits by the subcutaneous division of the femoral artery, a comparison was made between the lactic acid therein and that of the blood in circulation. Dr. C. P. Stewart kindly analysed the samples for me and found a definite and progressive increase in the lactic acid content of the extravasated blood at periods of 4, 8, and 24 hours after severance of the artery. A very oblique wound prevented any escape of the blood to the skin surface in this little operation. Ewing writes:—

> "The organisation of considerable masses of blood provides conditions favourable for very free growth of atypical cells. Some organising blood clots after fracture I have found quite difficult to separate from sarcoma. Formation of progressive traumatic angiomas which gradually extend beneath the periosteum, often enclosed by a shell

nature of the medium in which the irritant substances are suspended or dissolved. This medium must be insoluble in the tissue fluids, must be viscous in consistency, and must evaporate with extreme slowness. Gas-works tar will serve as an illustration of the embodiment of a chemical irritant in a medium which secures its prolonged action. To such combinations we will apply, for convenience, the term "potent substances."

Two examples will serve to demonstrate the dual nature of the potent substances with their irritant factor and constancy factor.

> Leitch recognised the irritant nature of pitch dust and its relation to the skin cancers of briquette makers. To secure its prolonged application, he dissolved it in human sebaceous oil, producing cancer in mice in less than three months by this means.[27]
>
> Twort believed that three irritants—chrysene, truxene, and benzerythene—were, in conjunction, capable of inducing cancer experimentally. To obtain their action, he suspended them in liquid paraffin, producing thus a carcinoma.[28]

Throughout the whole field of experimental carcinogenesis one is impressed by the universal use of the tars and oils as potent substances. Ethereal solutions of such substances act, of course, by the production of a fine film of the oil after the rapid evaporation of the ether. I know of only one recorded exception to this rule, where Leitch and Kennaway applied a very weak solution of potassium arsenite in water and alcohol to a large number of mice. In one mouse a carcinoma appeared. They repeated the experiment on several further series of mice, but failed to produce another positive result.[29] I have tried to obtain a cancer by this means in three series of mice totalling 150 animals without success. Spontaneous epithelioma does occur in mice, although rarely. In the incrimination of arsenic in the fate of this particular mouse, perhaps it would be permissible to state that the question is still sub judice.

In the cancers of occupational origin, one is similarly impressed by the effect of the tars and mineral oils in contrast to the absence of occupational cancerous skin conditions in the thousands of workers who are exposed to the action of undoubted chemical irritants applied in aqueous solution in which they are capable of rapid neutralisation and dilution. Henry, one of H.M. Inspectors of Factories, has given a valuable analysis of the occupational cancers, and his findings bear out the above statement. He refers to the fact that such an irritant as chrome has never yet been known to produce cancer.[30]

Medium of Application under Natural Conditions.

Can we proceed from the experimental and occupational categories to apply these views of a physico-chemical causation to the other, more common, varieties of cancer? I would suggest that this can reasonably be done, the place of the hydro-carbons, with their contained irritants, being taken by a variety of insoluble oily or greasy substances, such as the stale retained secretions, purulent exudates, the mucins under certain conditions, and the insoluble elements of old extravasations of blood. The toxic, irritant moiety in such insoluble media is formed, predominantly, by breakdown products of the fatty acids which accumulate in them and tend by staleness towards rancidity. I need not enter into a description of the large and important group of the fatty acids, except to remind you that many of them are insoluble in water and that they become saponified with the formation of soluble soaps in the presence of alkalis. The effect of these acids, especially lactic acid, is at present the subject of wide attention in relation to the cancer process and its genesis. Cramer refers the marked toxicity of lactic acid and to its peculiar digestive action, even in weak solutions, which causes a slow tissue necrosis.[31] Bierich and Rosenbohm state that, after the examination of a large number acids, bases, and alkalis, the only reagent which produced the same series of changes as are manifested in cancer is lactic acid.[32] Twort has produced papilloma with oleic acid, another of the group. He states that a well-marked hyperplasia of the skin of the animal treated is consistently present, and he awaits the advent of malignant tumours with confidence.[33] Bierich describes the solvent action of lactic acid upon collagenous tissues and states precisely that "lactic acid is the direct cause of the malignant invasion of normal tissues by tumour cells."[34]

Substances which are innocuous in pure form and in healthy organs tend to become toxic and irritant when decomposing under conditions of morbid stasis. The breast, the sebaceous glands, the prostate, and the subpreputial sulcus come readily to mind as areas in which these stale secretions may be operative. I shall quote from an excellent recent paper by Charteris[35]

> "The suggestion of mammary stasis has been strengthened by the finding of cysts, the contents of some being under considerable tension, and, moreover, it is well recognised that the material filling these dilated structures is usually quite abnormal in appearance, being often of a soft cheesy or thick creamy nature. Adair and Bagg found from a detailed clinical study of 200 consecutive cases of breast cancer, that only 8·5 per cent. of the women so affected had an apparently normal mammary history. In the remainder some abnormality was found from clinical data alone which appeared to justify the assumption tha mammary drainage had been defective. They believe tha the products of stagnation, decomposing and chemicall altered milk, mucus, &c., stimulate an excessive growth the epithelium lining the ducts and acini, and that, whe the process has not progressed far, it corresponds with t so-called 'mastitis.' Keynes gives a similar explanatic and mentions the presence of laminated plugs of keratin epithelium in the orifices of the main ducts as a contributo factor. Bagg (1926) has also undertaken experimental w with mice to endeavour to determine whether functio disturbance may have some causative relationship with onset of mammary cancer. This, in brief, consisted rapid breeding of a number of groups of animals, none which was permitted to suckle its litters, being re-ma immediately. Marked stasis in the ducts was ther produced, and in a number of cases artificial stasis was brought about by ligation of the duct orifices. The incid of mammary cancer amongst these animals was found t enormously greater than in the control groups. For exan in one group of 15 mice subjected only to rapid breed 13 developed mammary cancer, a rate of 87 per cent. compared with 5 per cent. in the controls. These re were obtained after about 8 to 12 months."

APPLICATION OF IRRITANT IN VARIOUS REGIONS

The association of carcinoma with chronic infected surfaces, with persistent sinuses, and the passage of infected mucus or frank pus prolonged period over a surface like the cervix is well known. The growth-stimulating prope of the infected secretions is again being recogn and even employed therapeutically, as in the Win Orr treatment of osteomyelitis.

In the *mouth*, the jagged tooth and ill-fi denture are undoubtedly of importance in respe the localisation by trauma of the carcinoma change in a diffuse leukoplakia. I would st however, the importance in conversion of the mucinous film which lies around the neck of the and the insoluble exudates of the pyorrhœic m The dentures of a series of patients will almost al be found to be covered by a thin slimy pellicle is insoluble in water and is difficult to remov friction of a brush but is soluble in ether and d pears readily in an alkaline solution. Where in quate attention is paid to the cleanliness of the m

THE RELATIONSHIP OF
RT SIZE AND BODY BUILD TO
ARDIOVASCULAR EFFICIENCY.

By H. A. Treadgold, M.D. Lond.,
WING COMMANDER, ROYAL AIR FORCE;

AND

H. L. Burton, M.B. Lond.,
SQUADRON LEADER, ROYAL AIR FORCE.

a previous paper [1] on the Size of the Healthy , and its Measurement, the following conclusions reached.

ation of the apex-beat by palpation is the most e clinical method of measuring the heart, and orthophy is the simplest and most accurate radiological d.

most reliable index of heart size is its total transverse ter, which varies directly with body-weight and ely with height at any given weight.

normal transverse diameter may be predicted with nable accuracy from body-weight for those whose t is ideal for weight. In others, both height and t must be taken into account in predicting heart

e observed transverse diameter expressed as a rcentage of the predicted normal is the best way of ating heart size, but measurements cannot be applied rule-of-thumb method in separating healthy from sed hearts, and must be considered in relation to the al data. In borderline cases changes in the shape of heart silhouette are likely to be of more value than surements.

the present paper a larger series of cases have taken (223 compared with 116) in order to see far these conclusions can be confirmed and at same time to investigate the relation, if any, ween total transverse diameter of the heart, body ld, and cardiovascular efficiency.

rthodiagrams were made in the erect posture, no case was accepted unless the two independent lines of the heart agreed within 4 mm. In practice iscrepancy as much as this rarely occurred. These ords were of healthy adult males aged 18–40 years, whom neither medical history nor clinical examinan of the heart revealed any evidence of cardiac ease, past or present. The urine was normal in cases. They included 40 candidates for cadetship, civil aviation B licence cases, 22 serving officers, candidates for short service flying commissions, candidates for stores commissions, 18 airman ndidates for flying, 10 reserve officers, and 18 misllaneous cases, and the average age in each weightoup of 5 kg. was between 23 and 26 from the -54 kg. group to the 75–79 kg. group. The 80–84 kg. oup averaged 27, and the 85–89 kg. group 31 years age.

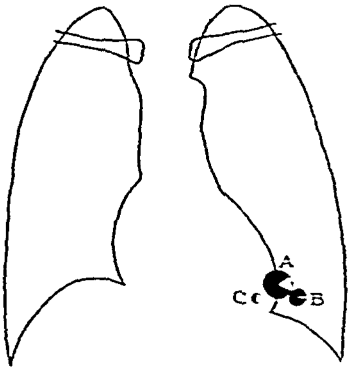
ACCURACY OF PALPATION OF THE APEX-BEAT.

In order to determine the degree of accuracy of cation of the apex-beat by palpation, a circular ad disc 1 cm. in diameter was attached to the hest wall over the estimated clinical apex prior to rthodiagraphy. It was soon found that the leftnost point on the chest wall at which a definite lift as imparted to the finger-tip was consistently xternal to the actual left border or apex of the eart as shown by the orthodiagraph. The lead was hen placed, with more satisfactory results, over the eft-most point at which a definite forward lift, at ight angles to the chest wall, was felt by the fingertip, and the term "clinical apex" is used in the following paragraphs to indicate this point. Lift is still imparted to the finger-tip in most cases 0·5 to 1 cm. further out than this, but is then oblique in direction instead of purely forward.

The first 60 cases were excluded to minimise errors in technique, and a series of 100 consecutive cases then gave the following result.

In 40 per cent. the clinical apex as marked on the chest wall corresponded to the anatomical apex as shown by X ray, and in 27 per cent. it corresponded to the left border of the heart above the anatomical apex. In 5 of these 27 cases the clinical apex was 3 cm. or more above the anatomical apex, in 12 cases 2 cm. above, and in 10 cases 1 cm. above. Measurements were taken to the nearest centimetre. The clinical apex was found to be external to the anatomical apex or left border of the heart in 25 per cent. of cases, and of these, in 19 it was 1 cm. external, and in 6, 2 cm. external. In the remaining 8 per cent. the clinical apex was internal but in only one case was the error made as much as 2 cm.

Fig. 1.



Normal orthodiagram illustrating the degree of accuracy obtainable by palpation of the clinical apex-beat. The size of the three circles indicates the relative frequency with which the clinical apex (A) agrees with, (B) lies outside, and (C) lies inside the anatomical left border or apex; the white segments indicating in each case the proportion of cases of tachycardia. Apart from this, the figure is purely diagrammatic.

In the 25 cases in which the heart was actually smaller than indicated by palpation, only one showed any degree of tachycardia. There were, however, 12 cases of tachycardia out of the 67 in which palpation and X ray agreed, and four cases out of the eight in which the heart size was underestimated.

At first sight these figures appear to conflict with the clinical experience that marked tachycardia or *tumultuous action of the heart is liable to cause over*-estimation of heart size by palpation, but there were no cases of extreme tachycardia or marked tumultuous heart action in the present series. It is also probable in such cases that if care is taken to feel the apex with the palm of the hand prior to more exact localisation with the finger-tip, as it should be in every case, fewer errors in this respect would be made.

It is interesting to note that although the clinical apex, as marked by the lead disc on the chest wall, was appreciably nearer the middle line than the more usually accepted position, the number of cases in which the lead was external compared to the number internal to the left border or apex, preponderates by 3 to 1. In other words, over-estimation of heart size by palpation is more frequent than under-estimation. It appears reasonable to assume that errors of as much as 2 cm. outside or inside the left border or apex are of rare occurrence in palpation of the normal heart, and that in over 90 per cent. the error is 1 cm. or less, provided that the selected point is the left-most at which forward thrust can be felt by the finger-tip. These points are summarised in Fig. 1.

of new bone, may apparently precede the later development of traumatic sarcoma."[42]

It would be unwise to digress at this point to discuss the effect of the retained element in menstrual blood in stimulating the growth of the fertilised ovum or of the action of the viscous secretion which covers the healthy granulating wound. In both situations there are many close resemblances, including glycolysis, to the process of cancer development. Fortunately, in the vast majority of instances, differentiation sets its seal upon the embryo and upon true repairing tissue. The slowness of carcinogenesis and its imperviousness to the differentiating influences, by reason of the surrounding fibrosis and capillary thrombosis during the critical evolutionary period of change in metabolism, render it woefully inveterate.

Substances Favouring Cell Growth.

The oleaginous medium is of importance chiefly because it acts as the excipient for the contained irritants. It has, however, certain auxiliary properties to which brief reference should be made.

The carcinogenetic agents which have been specially analysed have been found to possess some degree of activity as keratin solvents. Because of their oily nature they mix with the natural oils of the epithelial surfaces and in course of time reach the papillary lymphatics. Their insoluble nature leads to blockage of these delicate channels, and this is a possible explanation of the lymph stasis and papilloma formation which has been so cogently stressed by Sampson Handley.

Describing the surface action of fatty substances, a distinguished dermatologist states:

> "The fat is greedily taken up by the horny cells, causing them to swell up, damming back the natural evaporation and causing fluid to accumulate as far back as the papillary body, and thus on sensitive skins its application often produces a most undesirable hyperæmia and œdema.[43]

A further effect of the contact of oil with the surface of the living cell is an alteration in the interfacial surface tension of the cells with increase in their potassium content. The work of A. B. Macallum, of Toronto, on this subject deserves more attention than it has received in relation to carcinogenesis.[44]

Potassium is such a constant constituent of the living cell that all its attributes are worthy of full investigation. Its radio-activity may yet be demonstrated to be of some significance within the confines of the cell and the suggestion that it plays a part in the re-synthesis of carbohydrates[45] is worthy of consideration in relation to the comparative autonomy of the glycolising tissues.

> "Clowes and Frisbie found that rapidly growing tumours contain a high percentage of potassium and little or no calcium, whereas in old, slowly growing, relatively necrobiotic tumours the relation is reversed, the potassium decreasing greatly while the calcium increases. Beebe obtained similar results, and his analysis, supported by Clowes and Frisbie's findings, indicate the importance of potassium for cell growth. Injection of potassium salts into mice increases their susceptibility to inoculation (Clowes), while calcium decreases cancer growth (Goldzieher). Exposure of isolated cancer cells to calcium salts reduced their growth capacity when inoculated, apparently through reducing their water content. Both effects are counteracted by sodium (Cramer)."[46]

Cramer's views upon the imbibition of fluid by cells rich in salt are of great interest. He has found that the water content is highest in rapidly growing cells and lowest in the slowly growing tissues. Cells which are rich in water are the most susceptible to the action of X rays and radium.

> "The sensitiveness of a cell to these rays is dependent on the water content of its protoplasm, and since water is known to be a good absorbent for X rays and radium
> is easy to see why that should be so."[47]

The physico-chemical complex, which has b
suggested as the means by which conversio
brought about, is slow in effecting the cycle of cha
and the result may only become manifest after c
tion of the application of the potent substance. C
version being established, the transfer of the conver
cell from the epithelial zone may be determined
trauma, such as the rupture of a cyst or strain aro
the base of a papilloma. Deelman has sho
experimentally how the development of carcinom
accelerated along the lines where the trauma
scarification has been inflicted.[48] In place of
disjunction of a tumour cell, a steady infiltration
take place by a digestive action resembling th
the chorionic epithelium, the excess of lactic
from glycolysis being the probable explanatio
this capacity.

The persistence and multiplication of the conv
cell group in which the glycolytic career is cont
inaugurates the stage of established cancer a
beyond the scope of a discussion on ætiology.
first reactions against establishment have al
been referred to.

I shall not attempt to make a full summary.
suggestion has been made that the questio
ætiology may be simplified by dividing the ca
mata into three groups of Implantation, Conti
and Conversion. In the Conversion group the
tance of the physical nature of the medium
which the contained irritants act has been st
An endeavour has been made to correlate the
a considerable number of observers. The livi
knows nothing of our departmental methods of
and this fact necessitates a comprehensive
an endeavour to understand its processes.

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CARDIOVASCULAR EFFICIENCY.

t is the general consensus of opinion that no lly satisfactory system of gauging cardiovascular fficiency exists. Various methods based on altera- ions in blood pressure and pulse-rate, lying and tanding, with or without various amounts of exer- ise, have been devised, mainly by American bservers,[5–8] but they do not, in our opinion, show ny outstanding advantage over the methods em- loyed in the Royal Air Force since its inception in 1918, and all of them take longer to apply. Estima- ion of cardiovascular efficiency of the healthy male in the Royal Air Force is based on a consideration of the pulse-response test, the 40-millimetre test, and the blood pressure. The two former have been described elsewhere,[9] but a brief résumé at this stage is necessary in explanation of the tables shown.

The *pulse-response test* shows the degree of reaction to the assumption of the erect posture as well as to mild exercise. It consists of taking (1) the steady sitting pulse; (2) the pulse-rate on the assumption of the erect posture, the degree of rise indicating the efficiency of adjustment to this position; (3) the steady standing rate; (4) the pulse-rate immediately after exercise performed by placing one foot on a chair and rising on to it 5 times in 15 seconds; (5) the number of seconds required for the pulse to return to the steady standing rate. The pulse-rate per minute is calculated from the number of beats in five-second intervals, and a stop-watch is necessary for the accurate performance of this and the following test.

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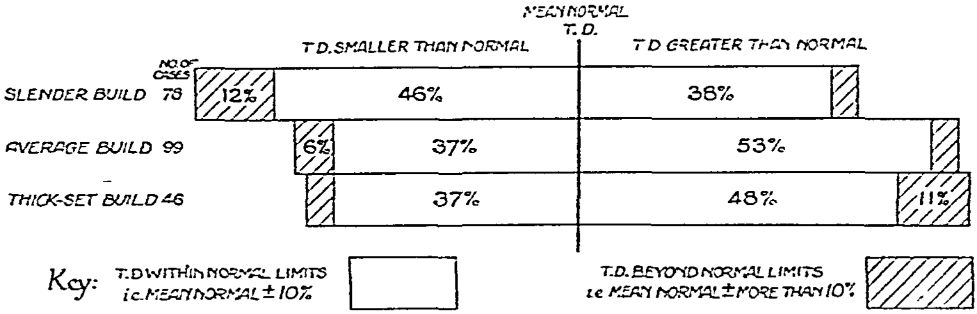
In measuring the blood pressure, the beginning of the fourth phase is taken as the diastolic pressure.

FIG. 3.



Relation between transverse diameter of the heart and body build. Percentages are omitted from the smaller spaces for the sake of clarity.

TABLE II.

—	Pulse response test.					Blood pressure.			40 mm. test.
	Sitting.	1st standing.	2nd standing.	After exercise.	Return to normal.	Syst.	Diast.	Pulse pressure.	1st 40 secs. Figures show number of heart-beats in five-second periods.
	Pulse-rates per min.				Seconds.				
t cases (140)	70	92	80	103	30	130	79	51	6/7, 8, 7, 7, 7, 7, 7, 7,
V.I. cases (52)	82	105	92	118	38	137	78	59	7/9,9, 10,10, 10, 10, 9,9,
ases with blood pressure 140/90 and over (27) ..	72	93	80	104	30	151	94	57	6/7, 8, 8, 8, 8, 7, 7, 7,
verage of 2413 R.A.F. pilots fit for flying in 1930	72	—	77	100	23	124	78	46	Not available.

TOTAL TRANSVERSE DIAMETER OF THE HEART IN RELATION TO HEIGHT AND WEIGHT.

Table I. shows the relation between body-weight and total transverse diameter of the heart (T.D.) in the whole series. Figures in italics are those obtained in the previous series.[1]

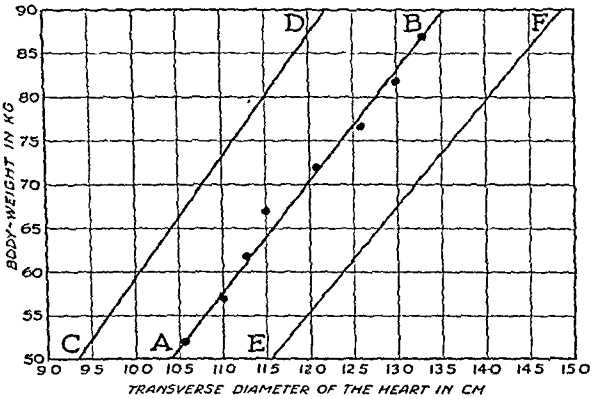
TABLE I.—*Relation of Transverse Diameter of the Heart and Body-weight.*

Weight groups (kg.)	50–54	55–59	60–64	65–69	70–74	75–79	80–84	85–89
Cases (223) ..	17	43	51	39	33	19	12	9
Average T.D. (cm.) heart .	10·6	11·0	11·3	11·5	12·1	12·6	13·0	13·3
	10·8	*10 9*	*11 2*	*11·6*	*12·1*	*12·2*	*13 4*	

Fig. 2 shows that the increase of transverse diameter is practically uniform with increase of body-weight, and for purposes of prediction can reasonably be taken as a straight line AB. Lines CD and EF show the lower limit (−10 per cent.) and the upper limit (+10 per cent.) respectively of the given transverse diameter at any weight.

The transverse diameter of the heart was found to vary inversely with height in all weight groups up to the 75–79 kg. group—i.e., those cases above the average height in each weight group had a smaller transverse diameter, and those cases below the average height had a larger transverse diameter than the average for the group. In the 80–84 kg. and 85–89 kg. groups this did not apply, but the number of cases in each group—namely, 12 and 9 respectively—are too small for any conclusion to be drawn as to whether this is of constant occurrence in these groups or not. The probable explanation is that almost all subjects over 80 kg. are disproportionately heavy for their height, and the heart in these cases tends to the horizontal position, associated with the short, broad chest commonly found in these individuals.

FIG. 2.



Relation between body-weight and transverse diameter of the heart. AB is the mean normal transverse diameter, CD is the mean normal minus 10 per cent, EF the mean normal plus 10 per cent. The normal range lies between CD and EF. *The dots represent the mean transverse diameter of each 5 kg. weight group of the present series.*

BODY BUILD.

In the study of body build, use is made of tables showing the ideal height and weight for any given age. The tables most generally used are those prepared from the American medico-actuarial tigations. These tables show height in sho weight inclusive of indoor clothing, and tables are available for both sexes. There are tables available based on medical insurance ex tions in Great Britain: (1) those of the Scottish L Assurance Co., which do not, however, differen the sexes; and (2) tables prepared from re supplied by seven important British insura offices, compiled from 28,697 medical examina for life assurance in 1921 and 1922,[2] and c males only. The weights are somewhat le those of the Scottish Life, and these again are than the American figures. As this rather sugg that actual weights and heights had been u though no definite information appeared to be ava able on this point, some 2000 cases, aged 18- examined at the Central Medical Establishment Royal Air Force, whose exact weight and he were known, were analysed by the statistical bran of the Air Ministry.

The figures were found to be of sufficient size f the compilation of a table showing the variation o weight and height for each year of age betwe 18 and 25. Over this range it was found that th weight at any given age and height agreed so closely with the figures of the British Life offices as to war rant the assumption that they represent a reasonably accurate picture of actual stripped weight and heig The weights in the Royal Air Force series for an given height and age are the higher of the two bu the discrepancy was usually below 1 kg., and th could be reasonably expected in view of the better physique of the present series compared to the population as a whole.

Using the figures of the British Life offices, th whole series was divided into three groups: (a) tho over 5 cm. too tall for their weight and age (slende build); (b) those within 5 cm. of ideal height fo weight (average build); (c) those over 5 cm. too shor (thick-set build). The 10 cm. allowance made i group (b) corresponds to an average variation i weight of 6–8 kg. at any given height.

BODY BUILD AND HEART SIZE.

In the 223 cases, 78 were in group (a), 99 in (and 46 in (c).

In group (a) (slender build) the transverse diame of the heart was, in 84 per cent. of cases, within t normal limits—i.e., ±10 per cent. of mean norma shown in Fig. 1, and 12 per cent. had abnorma small hearts—i.e., below −10 per cent. In group (average build) 90 per cent. were within nor limits. In group (c) (thick-set build) 85 per ce came within normality, but there were 11 per ce of abnormally large hearts.

In the total series 87 per cent. were within norma limits, 8 per cent. having abnormally small an 5 per cent. abnormally large hearts.

Fig. 3 illustrates these points, the main featur being the preponderance of abnormally small heart in the slender type and of abnormally large hearts i the thick-set type.

Bardeen [3] and Eyster [4] have produced formulæ f calculating transverse diameter from age, height, an weight, but when the many factors affecting hea size as expressed by transverse diameter are co sidered, it is doubtful whether such elaborate metho are required in practice. The body build, shape the chest, and height of the diaphragm, are all facto in determining whether the lie of the heart be of th vertical or horizontal type, irrespective of actual siz nsequently, although the transverse diameter pproximate indication of the heart size. it by ans affords an exact estimate of it, and this lly applies to those of abnormal build. An 's heart is usually larger than that of a seden- orker. and, taking all these factors into con- ion. we are of the opinion that for healthy between the ages of 18 and 40, a range of per cent. of predicted normal transverse dia- for any weight is a ably accu- tandard of ality. As xample, in 1, if the t is 70 kg., cted trans- diameter is cm., and d not be r 10·8 nor e 13·2 cm. s unduly tall ort for their ht should be n special sideration. n instance of this, the unduly tall individual lly has a heart of smaller transverse diameter one of average build, and consequently in such a , if the transverse diameter is found to be +10 cent. of predicted normal, it is suggestive of ological enlargement, if from the previous history, its. and clinical findings, the heart is suspected to abnormal. The deciding factor, however, in all derline cases is the shape of the heart outline and cular pedicle as determined by the oblique views well as the antero-posterior.

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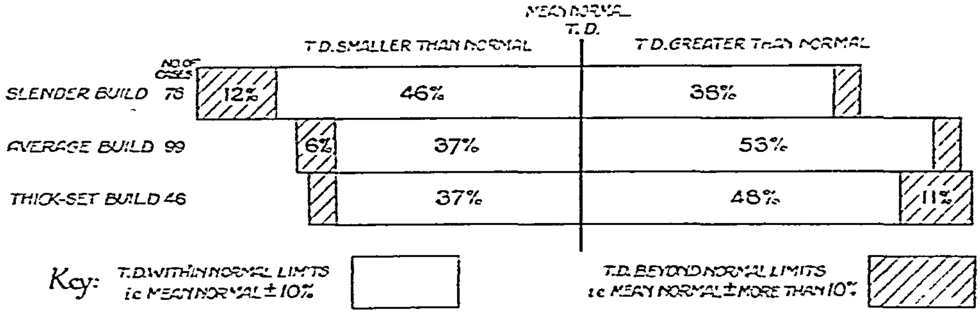

Relation between transverse diameter of the heart and body build. Percentages are omitted from the smaller spaces for the sake of clarity.

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In measuring the blood pressure, the beginning of the fourth phase is taken as the diastolic pressure.

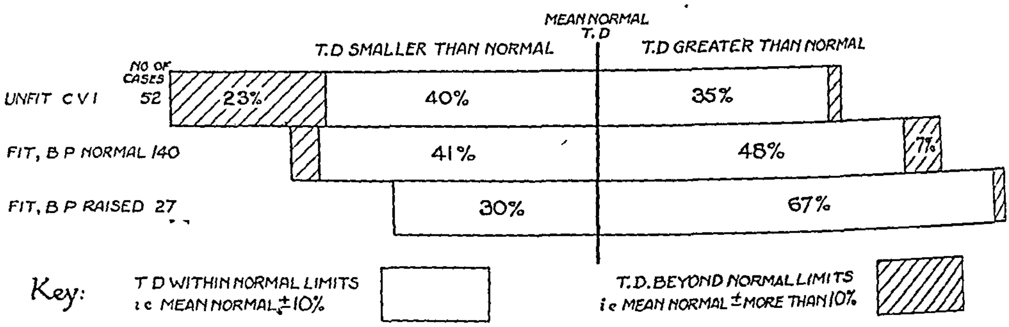
This is the point at which the clear sound heard with the stethoscope over the brachial artery changes to a faint thud prior to cessation of all sound.

The criterion as to whether an individual showed cardiovascular inefficiency or not was based on the Royal Air Force standards—i.e., whether he was, as regards his cardiovascular system, fit for Service flying.

The disproportionate number of cases of blood pressure of 140/90 and above in group (c) (thick-set build) seemed to justify special consideration of this type of case, as there were 27 in the whole series, and 14 of these occurred among those of thick-set build. We do not suggest that these raised blood-pressure cases are pathological. They are mainly single examinations, and in our experience such cases of raised blood pressure are usually lower when examined elsewhere than at the Royal Air Force Medical Board, where there is usually a pronounced emotional factor. In no case was there any clinical evidence of hypertrophy of the left ventricle, and in only one case was the heart shown by X rays to be beyond the upper limit of normality, whereas in the cardiovascularly efficient cases with normal blood pressure there were 10 out of 140 beyond that limit.

An interesting point is the rarity of blood pressures of 140/90 and over combined with cardiovascular inefficiency (C.V.I.). There were only four of such cases in the whole series, and for purposes of simplicity they have been omitted from the following table (II.), which shows the figures of the present series compared with those of 2413 fit pilots in the Royal Air Force examined in 1930.[10] The increased pulse pressure of the cases of cardiovascular inefficiency is due solely to the rise in systolic pressure, the diastolic remaining practically the same. This is the typical emotional response normally met with in this type of case, and is present to a less extent on a first examination of fit candidates, whose blood pressure averages 130/79 compared with the R Air Force pilot figure of 124/78.

FIG. 4.



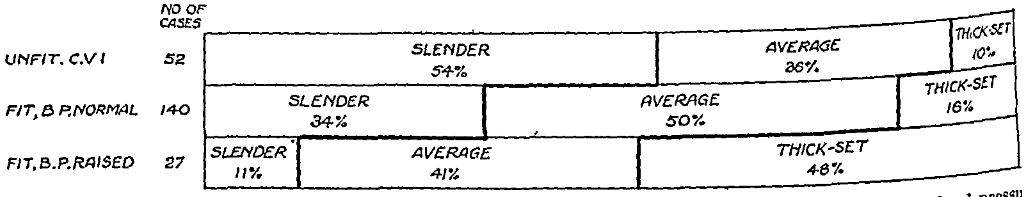
Relation between transverse diameter of the heart and cardiovascular efficiency. Percentages are omitted from the smaller spaces for the sake of clarity. C.V.I. =cardiovascular inefficiency. B.P. =blood pressure.

CARDIOVASCULAR EFFICIENCY AND HEART SIZE

Both Smith[11] and Meakins and Gunson[11] f that soldiers with symptoms of effort-syndrome h hearts whose transverse diameter was on the average 0·7 cm. smaller than the mean value of Dietlen's tables. Our figures show that the average transverse diameter of cases of cardiovascular inefficiency is 0·3 cm. below our own mean normal. When it is borne in mind that all cases were entirely symptomless, and would not have presented themselves for a medical examination reputed to be an unusually strict one unless they were fairly confident as to their medical fitness, the discrepancy is not marked. It seems probable that the effort-syndrome cases u war are recruited largely from the symptomless cardiovascular inefficients of peace time.

The preponderance of abnormally small heart among cases of cardiovascular inefficiency (23 p cent.) is in marked contrast both to the percenta found in the cardiovascular efficient type (4 p cent.), and to their complete absence among of raised blood pressure. These results are sh graphically in Fig. 4.

FIG. 5.



Relation between body build and cardiovascular efficiency. C.V.I. =cardiovascular inefficiency. B.P. =blood pressure.

CARDIOVASCULAR EFFICIENCY AND BODY BUIL

Smith[11] in his effort-syndrome cases found 65 per cent. were below normal weight. As n be expected from the preceding discussion, ther close relationship between slender build and ca vascular inefficiency. Out of the 52 cases o latter, 28, or 54 per cent., were more than 5 cm tall for their weight, and this figure rises to 8 cent. if actual ideal height for age and weig taken. The thick-set type is just the reverse of the characteristic feature of the group being the percentage of cardiovascular efficients and cas blood pressure (140/90 and over). The results own graphically in Fig. 5.

SUMMARY AND CONCLUSIONS.

he apex-beat of the heart as determined by ion coincides with the anatomical apex or left of the heart, as shown by the orthodiagram, -thirds of the cases examined. The margin of in clinical under- or over-estimation rarely ds 1 cm., and over-estimation is the more usual e two.

—In the total series of 223 cases the total trans- diameter of the heart is within ±10 per cent. edicted normal, based on weight alone, in 87 per of cases. Abnormally small hearts, as estimated heir transverse diameter, are present in 8 per . and abnormally large hearts in 5 per cent. of s.

In cases of average build, 90 per cent. of hearts within normal limits, 6 per cent. being below and r cent. above normality.

. Among those of slender build the transverse neter of the heart is below −10 per cent. of licted normal in 12 per cent. of cases.

. Among those of thick-set build the transverse meter of the heart is above +10 per cent. of dicted normal in 11 per cent. of cases.

. Height, in addition to weight, has therefore to taken into consideration in cases of abnormal ld, bearing in mind that the transverse dia- ter of the heart is usually smaller than normal those of slender build and larger in the thick-set pe.

7. All cases in which the heart size is at the border- e of normal range must be considered in relation their body build, history, mode of life, and clinical dings before they are pronounced as pathological, d changes in the heart silhouette are of more value such cases than measurements.

8. The relatively high percentage of abnormally nall hearts (23 per cent.) among cases of cardio- ascular inefficiency, as gauged by Royal Air Force sts and standards, is in striking contrast to the elatively low percentage (4 per cent.) in cases of ardiovascular efficiency.

9. Minor degrees of raised blood pressure (140/90 nd over) are rarely found among cardiovascular nefficients, and are most frequent in those of thick- et build.

10. Cardiovascular inefficiency is commonest in those of slender build.

We wish to express our thanks to Squadron Leader G. S. Marshall for suggestions and execution of the diagrams, and to Miss I. M. Marshall for secretarial assistance.

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TOXIC DIPHTHERIA:

COMBINED ANTITOXIN AND DEXTROSE-INSULIN THERAPY.

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S. ALSTEAD, M.B. LIVERP.,
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LITTLE BROMWICH.

IN a study of circulatory failure in diphtheria Schwentker and Noel[1] reject as contradictory and unsatisfactory no less than seven theories of its causation. With full acknowledgment of their debt to the pathological work of A. S. Warthin,[2] they conclude that "the symptoms of diphtheria intoxication are to a large part due to secondary constitutional disturbances in all of the essential body tissues." They show that (1) in the early phase of the toxæmia of diphtheria there is a rise in the blood-sugar due to an increased glycogenolysis. (2) As the toxæmia becomes more profound there is a steady decrease in blood-sugar which may result in hypoglycæmia. (3) As the specific effect of the toxin upon the tissues, including the pancreas, becomes more marked, glycogenesis is diminished owing to decreased insulin production. In consequence the blood-sugar again rises. They therefore suggest that in addition to antitoxin therapy in the severely toxic case of diphtheria, an attempt should be made to stabilise carbohydrate metabolism by the administration of dextrose and insulin. Schwentker and Noel record a short series of cases so treated with highly successful results.

A disorder of carbohydrate metabolism in toxic diphtheria has been noted by several workers. Mikami[3] found hyperglycæmia in rabbits which died within 24 hours of intravenous injection of diphtheria toxin, the hyperglycæmia reaching its maximum within three hours of injection and then gradually decreasing. He found that this hyperglycæmia could be prevented by double splanchnectomy, and he therefore assumed that it was of central origin. With a dose of diphtheria toxin not fatal in 24 hours a hypoglycæmia and diminution of liver glycogen occurred which was not prevented by double splanchnectomy. This work has been confirmed by Lawrence and Buckley,[4] and by Sweeney.[5] As far back as 1922, Lereboullet and his collaborators[6 7] showed that in a considerable proportion of cases of grave diphtheria a definite hypoglycæmia is present, while in mild and moderate cases the blood-sugar content is unaltered. Elkeles and Hermann[8 9 10] found a diabetic type of blood-sugar curve for a long period after recovery from diphtheria, and Schwentker and Noel[1] also report this type of curve. Hector[11] suggested the use of insulin in toxic diphtheria, and Kostyal[12] has employed dextrose-insulin therapy in diphtheria of all grades of clinical severity. Toomey[13] found that the use of dextrose decreased the incidence of heart-block and acute dilatation, but although in the presence of heart-block life was prolonged, none of his cases recovered.

We propose here to discuss the changes in the blood-sugar curve in diphtheria, and to present a series of cases of toxic diphtheria treated as suggested by Schwentker and Noel with dextrose-insulin in addition to diphtheria antitoxin. Another series of similar clinical severity treated in previous years with antitoxin alone is adduced for comparison.

TECHNIQUE AND RESULTS OF BLOOD-SUGAR ESTIMATION.

The method of estimation of the blood-sugar was that of Crecelius and Seifert,[14] based upon the conversion of picric acid to picramine acid. It permits of rapid colorimetric estimation, and requires only 0·2 c.cm. of capillary blood. Compared with the method of Folin and Wu, a constantly higher reading of less than 5 per cent. is shown. The blood-sugar estimations were made throughout by one of us (E. H.). The injection of adrenalin was avoided before and during the period of estimation.

As soon as possible after the admission of a patient suffering from toxic diphtheria a preliminary injection of antitoxin was given intramuscularly, and one hour later a resting blood-sugar estimation was made, followed by antitoxin and 20 g. dextrose intravenously (a sterile 50 per cent. solution at body temperature). Further blood-sugar estimations were made at intervals of ten minutes, one hour, one and a half hours, and two hours after the dextrose injection. By examination of the curve thus obtained a conclusion was reached as to the severity of the case and the need for insulin therapy. Experience has shown the greater the lag in the return of the curve to normal, the greater the toxæmia, and therefore the initial dextrose-tolerance curve was a valuable guide to prognosis. Hypertoxic cases showed a higher general level and more marked lag than the moderately toxic group. Even cases which had little or no clinical evidence of toxæmia showed a slight lag in the blood-sugar curves.

Fig. 1 shows the average values obtained in three groups, each of ten cases of faucial diphtheria, which were classified clinically as very mild, moderately toxic, and hypertoxic. It will be seen that a slight but definite lag is present in the curve representing the mild cases. All the patients in this group recovered with relatively small doses of antitoxin and without obvious complications. The graph of the moderately toxic cases shows a more definite lag at the end of the same period, while the curve of the hypertoxic group shows a higher general level and a more marked lag than either of the other groups. In the most severely toxic group a lag was persistently present in the dextrose-tolerance curves for an average of 20 days in those cases which recovered. The maximum duration of this diabetic type of curve was 44 days in one patient of Group III. In the moderately toxic group a "lag curve" was found on an average for seven days.

Only three of the hypertoxic cases showed a preliminary ("resting") blood-sugar content of less than 100 mg. per cent. The others showed an initial hyperglycæmia of varying degree, and this can be accounted for by the more advanced stage of disease on admission. In the absence of severe complications the dextrose-tolerance curves showed a progressive improvement as the patient recovered, but in those cases which had shown a profound early toxæmia and which developed severe cardiac or nervous complications, *a temporary return to the diabetic type of curve was observed at the onset of such complications.*

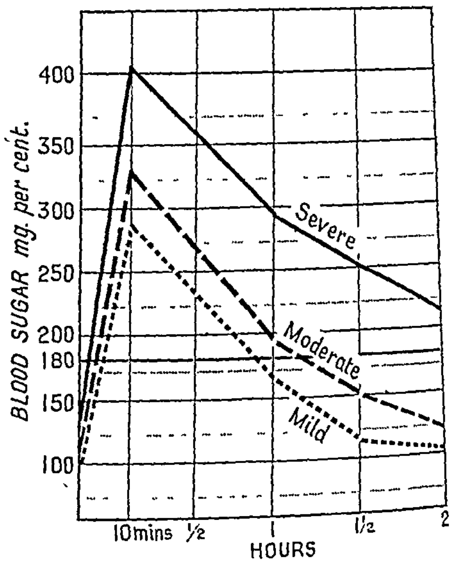
The prognostic significance of these dextrose-tolerance tests is emphasised by the occasional occurrence of a grossly abnormal curve. Such a curve usually indicates a hopeless outlook, and an example is given in Fig. 2.

The effect of insulin upon the diabetic type of curve in toxic diphtheria is to give a reading approximating more closely to the normal throughout the curve. In Fig. 3 are two curves which were obtained from a patient on consecutive days and in similar circumstances, with the exception of the administration of insulin before the giving of dextrose in curve B.

PRACTICAL APPLICATION.

Thus the evidence brought forward above conf the work of Schwentker and Noel[1] on the car- hydrate metabolism in toxic diphtheria. The charac of the dextrose-tolerance curve varies with the cli severity of the case. The amount of lag is direct proportional to the degree of toxæmia; in the mil

FIG. 1.



Average blood-sugar curves in three groups of cases

cases there is only a slight deviation from the norm curve, but in the moderate and severe grades toxæmia the curve becomes progressively diabe in character. The practical value of attempting correct the disturbance of carbohydrate metabol in toxic diphtheria may be judged from a compari of the two series of cases detailed below. In or to facilitate comparison as to the clinical severity the two groups, the short classification of fau diphtheria by Bie[15] has been adopted. Briefly t is as follows:—

A. Cases of *slight severity:* membrane *not* fully cove the tonsils; post-nasal catarrh occasionally; fœtor or sl peri-adenitis (only exceptional).

B. Cases of *moderate severity:* membrane covering tonsils and the palatine arches or the tip of the uv post-nasal catarrh; fœtor and a slight degree of adenitis frequently present; exceptional only are minuria and other signs of toxæmia, and a more ma degree of peri-adenitis—e.g., glands of "plum" or " egg" size.

C. *Severe cases:* membrane covering the uvula and palate, and frequently the hard palate also, or the b mucous membrane or posterior pharyngeal wall; post- catarrh and fœtor the rule; albuminuria frequent; of toxæmia and very marked peri-adenitis.

Needless to say, no clinical classification, w must necessarily be based upon anatomical exter membrane, can be completely satisfactory. subtle but vital factor of toxæmia is always imposs of classification. In Bie's classification larynge diphtheria and post-nasal diphtheria without visi membrane are not included. In both our grou cases with a laryngeal element and those endi fatally within 48 hours of admission to hospital ha been excluded.

Most of the cases in the two series discussed bo fall into Group C. A few were in Group B, and so were more appropriately graded as B–C, bei intermediate in clinical severity between the t grades. Serial electrocardiographic records w ıed in nearly all the dextrose-insulin group, imilar records exist for many of the controls. electrocardiographic work will be separately ibed by one of us (S. A.).

XTROSE-INSULIN THERAPY AND ITS RESULTS.

Immediately on admission: (*a*) Intramuscular tion of antitoxin (32,000 to 56,000 units). reliminary blood-sugar estimation.

) One hour after admission: (*a*) Intravenous tion of antitoxin (32,000 to 100,000 units). ntravenous injection of dextrose (20 g. of rose in 50 per cent. solution). Serum and dextrose given together with several 20 c.cm. syringes *very ly* at 37° C. The serum is in concentrated form undiluted.

) Ten minutes after intravenous dextrose, second d-sugar estimation.

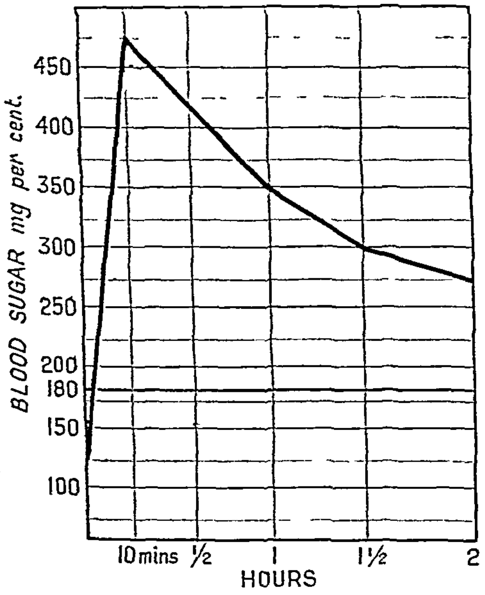
4) One hour after intravenous dextrose, third d-sugar estimation.

5) One and a half hours after intravenous dextrose, rth blood-sugar estimation.

6) Two hours after intravenous dextrose, fifth od-sugar estimation.

7) If the two-hour blood-sugar estimation shows low return to normal a suitable dose of insulin is en intramuscularly (10 to 30 units). Subsequent atment consists in giving glucose by mouth in all es where the coöperation of the patient can be tained. Commonly, children receive, diluted in nonade, from 4 to 8 oz. of glucose by mouth daily at least the first ten days after admission, and in me cases for three or four weeks. If the patient fuses, or is unable to tolerate, glucose by the mouth, 40–100 g. in 50 per cent. solution are given intravenously during each 24 hours.

FIG. 2.

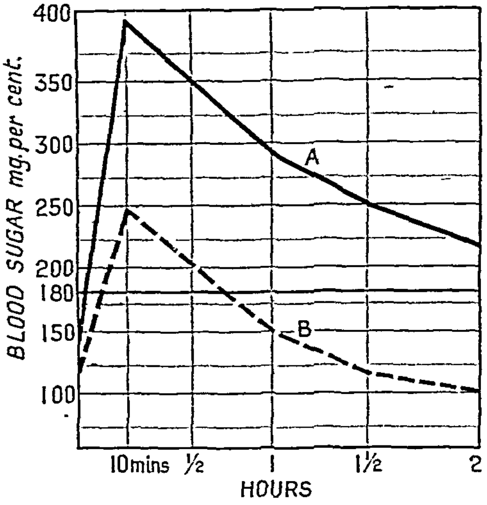


Blood-sugar curve showing pronounced lag in a severe case of diphtheria ending fatally.

Transient glycosuria after the initial dose of dextrose appears to be rare in the severely toxic cases, but was almost invariably present in the moderately toxic cases. Albumin was found in the urine at some stage of the disease in all the moderately and severely toxic cases.

Dosage with insulin depends on the degree of toxæmia as estimated by the initial dextrose-tolerance test. In accordance with the practice of Schwentker and Noel,[1] 1 unit of insulin is given for every 1 to 2 g. of dextrose, and it is then injected twice daily until the patient has passed the stage of acute toxæmia. There are often indications for large doses of insulin—e.g., 30 units twice daily—hence the possibility of hypoglycæmia must be emphasised.

FIG. 3.



Blood-sugar curves: (A) without insulin; (B) next day with 20 units of insulin.

The treatment for this condition consists in the immediate injection intravenously of about 20 g. of dextrose. Insulin therapy in these cases *must* therefore be controlled by repeated blood-sugar estimations, and in the series under consideration such tests were performed at frequent intervals. Not uncommonly, restlessness and delirium were present when the initial toxæmia was severe. Morphia in very small doses (never more than gr. 1/16th even for an adult) was found effective in combating these conditions.

It has already been stated that in the routine treatment of these cases the patient first receives an injection of serum intramuscularly. The advantages of this are that to some extent it acts as a desensitising dose for the subsequent intravenous injection; and, secondly, it provides a reservoir of antitoxin which is drawn upon during the following days when the concentration of antidiphtheritic serum in the blood due to intravenous injection is diminishing.

RESULTS.

Eighty-nine consecutive cases (Series A) were treated by dextrose-insulin therapy, and for purposes of comparison 131 similar cases (Series B) in which dextrose and insulin were not used have been taken as controls. It will be seen on reference to Tables I.–IV. that with regard to age-groups, stated day of disease at the commencement of treatment—i.e., admission to hospital—and severity according to Bie's classification, the two groups of cases are strictly comparable. Further, serum dosage in both series was approximately the same. Intravenous serum therapy was employed in all cases in the two groups with the exception of one case in Series A and two cases in Series B, the reason being that attempts to give serum intravenously were unsuccessful owing to the collapsed state of the patient.

Several important points emerge from a study of the Tables. The first is that the case-mortality in the control group was 35·9 per cent., whereas that of the dextrose-insulin group was 22·5 per cent. Since the only essential difference between the two series was the employment in the second series of dextrose-insulin therapy in addition to an average amount of antitoxin very much the same as that employed in the first series, the conclusion seems clear that the factor responsible for the striking difference in case-mortality was the stabilisation of the carbohydrate metabolism by the use of dextrose-insulin. In both groups the percentage of cases which recovered without paresis was approximately the same (Series A 20·2, Series B 19·9 per cent.), but in the dextrose-insulin group a considerably greater percentage of cases recovered with paresis during the course of the disease as compared with the control group; this difference amounts to 13 per cent. (Series A 57·3, Series B 44·2 per cent.). It is significant that this percentage difference corresponds almost exactly with the difference in case-mortality of the two groups (Series A 22·5, Series B 35·9 per cent.), indicating that this percentage of the dextrose-insulin group escaped fatal circulatory complications, but, owing to the severity of the infection, developed paralysis later in the disease.

Apparently the incidence of serum-sickness—e.g., rigors, collapse, vomiting, and rashes—within an hour or an hour and a half of intravenous injection of serum was noticeably reduced in the dextrose-insulin group; 18·4 per cent. of this group showed early serum phenomena, whereas 30 per cent. of the control series developed reactions. How far this difference is due to the simultaneous injection of dextrose, and how far to the desensitising effect of the intramuscular dose of serum which preced intravenous injection, cannot be assessed.

REPRESENTATIVE CASES.

The following are brief accounts of five cases of severe types drawn from Group A:—

CASE 1.—Girl, aged 13. Admitted on fifth day of dis Most of the fauces covered with diphtheritic membra profuse nasal discharge, fœtor, and cervical adenitis ca early bull-neck. Moderate toxæmia. No gross cha abnormality of the heart on admission. Antidiphtheri serum: 48,000 units intramuscularly; 80,000 unit venously with 20 g. dextrose one hour later. Abou dextrose-tolerance test: 80-380-230-190-135. Insulin: 20 to 4 glucose given by mouth daily. Progress satisf every day for the first three weeks. throat clear by the ninth day and obvious signs of t disappeared at the same time. Not more than a m degree of myocarditis detected clinically or electr graphically. No paralyses. Further dextrose-t curves: sixth day, 105-315-215-170-130; nint 90-356-175-115-85; eighteenth day, 125-300-190- —i.e., the gradual disappearance of the diabetic curve was simultaneous with the clinical impro Patient discharged well on the sixty-sixth day of

CASE 2.—Boy, aged 5. Admitted on second day of Marked œdema of the fauces and extensive faucial me Profuse nasal discharge and fœtor oris. Bilateral adenitis. Obviously toxic; quiet and apathetic. apparently normal on admission. Antidiphtheritic 40,000 units intramuscularly; 72,000 units intra with 25 g. dextrose. Preliminary dextrose-toleran 120-150-320-200-250. Insulin: 30 units daily for week in hospital; 20 units daily for second wee 10 units daily from seventeenth to twenty-first day. by mouth: about 5 oz. each 24 hours. Throat sixth day of disease; general condition improved first; no paraly . . . readings in conval sixth day, 105- . . . th day, 100- 125-90; fourte . . . -100-110; ni

TABLE I.—*Cases Treated with Dextrose and Insulin.*

	SERIES A.				SERIES B.—CONTROL CASES.			
Age-group.	Cases.	Deaths.	Recovered.		Cases.	Deaths.	Recovered.	
			With paralysis.	Without paralysis.			With paralysis.	Witho paraly
0- 2	—	—	—	—	—	—	—	—
2- 5	9	2	5	2	9	4	3	2
5-10	49	12	27	10	64	29	25	10
10-15	22	6	11	5	42	11	24	7
15-20	7	—	6	1	9	2	4	3
20 and over	2	—	2	—	7	1	2	4
Total	89	20	51	18	131	47	58	26
—	—	22·5 %	57·3 %	20·2 %	—	35·9 %	44·2 %	19·9

Case-mortality = 22·5 %. Case-mortality = 35·9 %.

TABLE II.

	SERIES A.					SERIES B.—CONTROL CASES.				
Day of disease on admission ..	1st.	2nd.	3rd.	4th.	5th and over.	1st.	2nd.	3rd.	4th.	5th and ove
	1	15	19	23	31 (=34·8 %)	—	17	37	34	43 (=32·8

TABLE III.—*Distribution of Cases in Bie's Groups.*

SERIES A.				SERIES B.—CONTROL CASES.			
I.	II.	II.-III.	III.	I.	II.	II.-III.	III.
—	4	11	74 (=83·2 %)	—	8	12	111 (=84·7 %)

TABLE IV.

	SERIES A.				SERIES B.—CONTROL CASES.			
Route.	Average unitage in 1000's.	Cases.	Deaths.	Immediate serum sickness.	Average unitage in 1000's.	Cases.	Deaths.	Imme ser sickn
Intramuscular only ..	60	2	—	—	144	1	1	—
Intravenous only ..	72	3	—	16 = 18·0 %	69·25	48	14	39 =
Intramuscular and Intravenous combined	43 65·5 } 108·5	84	20		48·25 53 } 101·25	82	32	
Total		89	20			131	47	

100-260-120-90-100. Discharged well on seventy- day of disease.

E 3.—Boy, aged 18. Ill for six days on admission. , blood-stained faucial and nasal membrane; intense ; subsiding cervical adenitis. Toxæmia extreme. al signs of myocarditis present from the first. Anti-heritic serum: 48,000 units intramuscularly, and 0 units intravenously about one hour later. Dextrose-ance test, initial curve: 135-325-180-145-150. Glucose freely by mouth, and frequent intravenous injections xtrose in 50 per cent. solution. Insulin: 20-60 units for nearly three weeks. Cardiac damage severe; isive myocarditis with softening of the heart sounds riple rhythm, dilatation of the heart, and bundle-branch (E.C.G.). General condition extremely poor. Palatal, yngeal, ciliary, and diaphragmatic paralyses developed. her dextrose-tolerance tests gave results as follows: h day, 105-260-140-100-90; fourteenth day, 150-420-250-200; seventeenth day, 110-275-200-150-110. 1 the onset of bundle-branch block the readings were: 00-250-200-150 (twentieth day of disease), showing rrence of the diabetic type of curve. Convalescence very slow; in hospital 105 days.

ASE 4.—Boy, aged 10. Admitted on third day of disease. ensive deposits of membrane in the throat but no nasal harge; adenitis and peri-adenitis; fœtor oris present. rious toxæmia. Antidiphtheritic serum: 48,000 units amuscularly, and 96,000 units intravenously one hour r with 20 g. dextrose. Preliminary blood-sugar reading: -400-230-175-175. Patient refused fluids by mouth; st of the glucose given orally was vomited; daily injec-as of dextrose (20 g.) were given *intravenously*. Local ponse to serum was satisfactory, but toxæmia gradually reased, and on the eighth day of disease (day of death) trose-tolerance showed an increased lag, viz.: 120-415-)-275-230. Serial electrocardiograms showed an increasing volvement of the myocardium, and a few hours before ath complete heart-block was present.

CASE 5.—Girl, aged 4½. Admitted on fourth day. Old embrane covering most of the fauces and hard palate; pious membranous nasal discharge; breath very offensive. lateral cervical adenitis and peri-adenitis. Heart: parently normal on admission except for the tic-tac ythm. The liver was palpable 2 in. below the costal argin. Toxæmia was profound, and characterised by arked pallor and apathy. Antidiphtheritic serum: 40,000 its intramuscularly, and 96,000 units intravenously about e hour later with 25 g. dextrose. Four to six ounces of ucose taken by mouth daily. Initial dextrose-tolerance st: 100-450-330-325-300, showing a well-marked lag. isulin: 20-40 units given for first three weeks, and 10 units r following nine days. Acute toxæmia for first week with cal and petechial hæmorrhages. Gradual improvement hen began; at the seventh day of disease the blood-sugar urve was: 80-375-225-125-90. Tic-tac rhythm of the eart recurred frequently. Slight palatal paralysis only. Further dextrose-tolerance tests gave the following results: inth day, 125-425-250-200-120; twelfth day, 150-425-300-125-100; twenty-seventh day, 150-425-275-150; hirtieth day, 75-250-215-130-120. The curves were thus persistently abnormal until convalescence was fairly established in sixth week; discharged on eighty-third day of disease.

We are indebted to Dr. E. H. R. Harries, late medical superintendent of Little Bromwich Hospital, for his assistance and for facilitating the carrying out of this work; also for permission to publish the results of our investigations.

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THE TREATMENT OF THE MÉNIÈRE SYNDROME BY THE ZÜND-BURGUET ELECTROPHONOID VIBROMASSAGE.

BY J. A. KEEN, F.R.C.S. ENG.,
AURAL SURGEON, LEICESTER EDUCATION COMMITTEE; AURIST, LEICESTER PUBLIC MEDICAL SERVICE.

THE treatment of the Ménière syndrome has always presented great difficulties to both physicians and otologists. Therefore any new method which has been found consistently successful in a series of cases should be placed on record.

In Ménière's classical case, first published in 1861, there was intra-labyrinthine hæmorrhage on both sides with destruction of labyrinthine function (Ménière's disease). It is now recognised that such a condition is extremely rare. For all practical purposes, patients who complain of attacks of vertigo associated with other ear symptoms are suffering from Ménière's syndrome. In contrast to "Ménière's *disease*," the affection is usually unilateral in the syndrome and the labyrinth as a rule recovers its function after the attack of vertigo has subsided. However, the hearing may remain impaired to a greater or lesser extent, and it is rare to find absolutely normal hearing on the affected side.

The condition is not very common, and I do not think that in an ordinary aural practice one would meet with more than three or four cases a year. I have looked through a file of 800 case-records of patients with ear, nose, and throat conditions and have found amongst them four cases where I made a diagnosis of Ménière's syndrome.

OTHER METHODS OF TREATMENT.

Treatment by drugs is admittedly unsatisfactory, and this partly explains the gloomy prognosis usually given to sufferers from the syndrome. One cannot consider that these patients are gravely ill; yet they are hindered from following their occupations by the constantly recurring attacks of giddiness, and they tend to get very depressed. During the acute attack the patient is kept absolutely at rest in bed, where he is allowed to assume any position which gives the maximum of relief. If vomiting be severe and threaten to exhaust him, a full dose of morphia may be given. Afterwards, we are advised to rely chiefly on the bromides, also aperients to check any tendency to constipation. Chronic pharyngitis is often present, and the patient may have to give up smoking. If he appears in low health, a general tonic is often more beneficial than sedatives. Quinine should be avoided—and this may be looked upon as a general rule in all ear affections.

The patient will get over the acute attack, even if nothing is done. His problem is to get relief from the repeated attacks and to feel reasonably certain that he can lead a normal life without the constant fear of attacks of giddiness which may surprise him at any moment. Attacks have overtaken one of my patients when he was driving a car, with great danger to himself and to others.

Counter-irritation is often recommended, and blisters or stimulating ointments may be applied behind the ear. Many years ago Dr. T. Wilson Parry recommended the insertion of a seton into the skin behind the ear; this had to be worn continuously for six months.[1] One patient was completely relieved by the Tables. The first is that the case-mortality in the control group was 35·9 per cent., whereas that of the dextrose-insulin group was 22·5 per cent. Since the only essential difference between the two series was the employment in the second series of dextrose-insulin therapy in addition to an average amount of antitoxin very much the same as that employed in the first series, the conclusion seems clear that the factor responsible for the striking difference in case-mortality was the stabilisation of the carbohydrate metabolism by the use of dextrose-insulin. In both groups the percentage of cases which recovered without paresis was approximately the same (Series A 20·2, Series B 19·9 per cent.), but in the dextrose-insulin group a considerably greater percentage of cases recovered with paresis during the course of the disease as compared with the control group; this difference amounts to 13 per cent. (Series A 57·3, Series B 44·2 per cent.). It is significant that this percentage difference corresponds almost exactly with the difference in case-mortality of the two groups (Series A 22·5, Series B 35·9 per cent.), indicating that this percentage of the dextrose-insulin group escaped fatal circulatory complications, but, owing to the severity of the infection, developed paralysis later in the disease.

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REPRESENTATIVE CASES.

The following are brief accounts of five cases of severe types drawn from Group A:—

CASE 1.—Girl, aged 13. Admitted on fifth day of disease. Most of the fauces covered with diphtheritic membrane, profuse nasal discharge, fœtor, and cervical adenitis causing early bull-neck. Moderate toxæmia. No gross clinical abnormality of the heart on admission. Antidiphtheritic serum: 48,000 units intramuscularly; 80,000 units intravenously with 20 g. dextrose one hour later. In dextrose-tolerance test: 80-380-230-190-135. About glucose given by mouth daily. Insulin: 20 to 40 every day for the first three weeks. Progress satisfact throat clear by the ninth day and obvious signs of tox disappeared at the same time. Not more than a mod degree of myocarditis detected clinically or electroca graphically. No paralyses. Further dextrose-tole curves: sixth day, 105-315-215-170-130; ninth 90-356-175-115-85; eighteenth day, 125-300-190-10 —i.e., the gradual disappearance of the diabetic ty curve was simultaneous with the clinical improve Patient discharged well on the sixty-sixth day of di

CASE 2.—Boy, aged 5. Admitted on second day of dis Marked œdema of the fauces and extensive faucial membrane. Profuse nasal discharge and fœtor oris. Bilateral cervical adenitis. Obviously toxic; quiet and apathetic. Heart apparently normal on admission. Antidiphtheritic serum: 40,000 units intramuscularly; 72,000 units intravenously with 25 g. dextrose. Preliminary dextrose-tolerance test: 120-450-320-290-250. Insulin: 30 units daily for the first week in hospital; 20 units daily for second week; and 10 units daily from seventeenth to twenty-first day. Glucose by mouth: about 5 oz. each 24 hours. Throat clear on sixth day of disease; general condition improved from the first; no paralyses. Blood-sugar readings in convalescence: sixth day, 105-375-270-150-125; ninth day, 100-375-145-125-90; fourteenth day, 100-250-150-100-110; nineteenth irmed the diagnosis, and who reported that two is fellow examiners had at first totally failed to the murmur and thrill correctly.

he following case is recorded because it not only rides a clear explanation of the mechanism by ch the observed thrill was produced, but also gests a possible mechanical reason for the rarity ll aortic diastolic thrills.

CASE RECORD.

he patient was a 'bus driver, aged 49. He was nitted to St. Bartholomew's Hospital under the e of Sir Percival Hartley, to whose kindness I am ebted for permission to publish the case. His nplaints were dyspnœa on exertion and swelling the feet.

istory.—On going to work on Nov. 10th, 1930, he was ted with a sudden attack of dyspnœa. This lasted for hour, and after it he came to St. Bartholomew's Hospital, ere a lesion of the aortic valve was diagnosed. His ssermann reaction being positive, he was given a course neo-arsphenamine (4·65 g.) and bismuth (8 c.cm.). He atinued at work until Jan. 10th, 1931, when he had a ond similar attack of dyspnœa, lasting again for about hour. On March 2nd, after a heavy day's driving, he ticed that he was unusually exhausted, and that his legs re swollen. Dyspnœa on exertion was now more pronounced. He attended hospital again, and was admitted March 9th.

Condition on Examination (April 13th).—The atient was lying comfortably in bed. There as no pallor or cyanosis, but slight orthopnœa was pparent. There was no increased pulsation in the eck. The chest was slightly emphysematous. A iffuse and very slight systolic cardiac impulse was isible in the fifth and sixth spaces. The apex-beat as palpable 4½ inches from the mid-line in the ixth space. The impulse was feeble and diffuse. Percussion confirmed the palpatory signs. On uscultation the first and second sounds were naudible. Coinciding with systole, as judged by the pulsation to be felt over the præcordium, there was at the apex and over the aortic base a soft, distant, blowing systolic murmur. Coinciding with diastole, there was a harsh, loud, twanging murmur accompanied by a thrill. This thrill was best felt over the aortic base and the upper end of the sternum. The diastolic murmur was loudest here also, but was conducted along the left border of the sternum to the apex in addition. Both thrill and murmur were easily definable, and could be accurately timed in relation to the præcordial impulse and the carotid pulse. The description of the diastolic murmur as a harsh, loud, twanging sound occurs in my notes made at the time.

The pulse was of the water-hammer type. The blood pressure was 134/30. The electrocardiograph showed a regular sinus rhythm, left-sided preponderance, inversion of "T" in lead I, and slight widening of the Q R S complex to 0·19 of a second. A radiogram taken on March 17th showed a general enlargement of the heart, which was slightly displaced to the right, and also evidence of a small, left-sided pleural effusion.

The Wassermann reaction was positive, as was the sigma reaction (16·8 units). The diagnosis was thus "syphilis of the heart with aortic incompetence and some congestive failure." The patient remained in hospital until May 2nd, when he was discharged improved. On June 25th he was readmitted with a more advanced condition of congestive failure than before. Œdema of the feet and legs, ascites, and albuminuria were present. The cardiac physical signs remained unchanged. He suffered from several attacks of acute left ventricular failure, characterised by collapse, severe dyspnœa, and a weak, rapid pulse. He died suddenly on Nov. 20th.

Post Mortem.—The heart was generally enlarged, but the left ventricle showed the greatest change. The chamber was dilated and somewhat hypertrophied, the muscle being rather friable and pale. The aortic ring was considerably stretched, easily admitting three fingers. The aortic cusps were soft, thin, and flexible along their free edges, showing no rigidity, puckering, or distortion of natural outline. At their junction with the aortic wall the commissures showed some œdema and thickening, characteristic of syphilitic infiltration, but of a very early stage. The coronary orifices were slightly œdematous. The first part of the aorta showed marked and characteristic syphilitic aortitis, with its longitudinal puckering and scarring. The changes were similar, but less marked, in the second part of the aorta.

It was clear from the post-mortem examination that aortic incompetence had been present, that this was due to stretching of the aortic ring from syphilitic aortitis, and that the aortic cusps were free, flexible, mobile, and not of themselves responsible for the valvular leak.

DISCUSSION.

Thrills and murmurs are caused by vibrations set up either in the blood stream or in the cardiac structure, or in both. Murmurs frequently occur without thrills; but thrills never occur without murmurs, although in some cases of mitral stenosis a low rumbling diastolic murmur is less easy to distinguish than is the associated coarse thrill.

Whether a thrill will be palpable in any case will depend upon the presence of vibrations sufficiently coarse to be detected by the hand. The difference in sensitivity between the sense organs of hand and ear will therefore be the measure of the probability of the existence of a palpable thrill when a murmur is present. In aortic regurgitation a murmur is almost invariably present, while a thrill is almost always absent. The common causes of aortic regurgitation are acute rheumatism, syphilis, arterio-sclerosis, and septic endocarditis. The valvular conditions generally accompanying each of these is worth recapitulating. In the rheumatic type, the valve cusps are thickened, sclerosed, and retracted. The cusps are stiff, fibrosed, and even calcified. In arterio-sclerosis, stiffening and calcification of the cusps is also present. Septic endocarditis is almost invariably superimposed upon an already diseased valve. Syphilitic aortic regurgitation results either from the invasion of the cusps at their commissures, infiltration of their substance, with subsequent scarring, thickening, and deformity, or from stretching of the aortic ring from syphilitic aortitis. In the latter case it is rare for the valve cusps themselves to escape.

In the case described the aortic regurgitant diastolic thrill was due to the fact that the aortic ring was stretched and the valve cusp edges free and flexible. It is suggested that at the commencement of diastole and during early diastole the regurgitating blood stream was so opposed to the free taut edges of the flexible cusps that the latter vibrated coarsely, like the reed in a clarinet, and gave rise to a "twanging" murmur and the marked diastolic thrill. If the cusps had been stiff, if their edges had been thickened, if their relation to the direction of the opposing blood stream had been slightly different, or if the rate of this stream had been other than it was, a murmur would doubtless have resulted, but not a harsh musical note, nor the accompanying coarse thrill.

Reference to the clarinet, or other such wind instrument, shows us what conditions are necessary this measure; the Ménière attacks in this case had been so frequent and obstinate that an operation on the labyrinth would probably have been suggested nowadays. Parry explains that the seton acts by continuous counter-irritation, and suggests that there is a direct action on the vasomotor system of a special skin area and that this action reflexly influences the vasomotor nerves of the labyrinthine vessels. It is probable that this barbarous method of treatment was used in a good many cases in the past.

A great advance in therapeutics was made when it became recognised that attacks of labyrinthine vertigo were frequently due to unilateral Eustachian obstruction, as Mr. Sydney Scott so clearly demonstrated. Many patients have been cured by the systematic use of the Eustachian catheter.[2]

VIBROMASSAGE.

In my experience, the quickest and most certain way of arresting the attacks of vertigo is to apply the Zünd-Burguet electrophonoid vibromassage. My main purpose in writing this paper is to make it more widely known how very successful the vibromassage by sound stimulation can be in relieving vertigo, and to induce others to give this treatment a trial

I began to use the Zünd-Burguet electrophone in 1922, after having had the privilege of seeing Dr. G. C. Cathcart use the treatment in London and also of seeing M. Zünd-Burguet in Paris. In their respective books on the treatment [3] [4] it is stated that in favourable cases feelings of giddiness disappear, while hearing is improved and tinnitus relieved. However, it is not specially mentioned that one can relieve the Ménière symptom-complex, and I approached these cases very diffidently at first. After a time it became obvious to me that the vertigo responded more quickly to the electrophone than any other symptom. While one has many disappointments as regards relief of deafness and tinnitus, the patient with the typical Ménière syndrome can almost certainly be promised relief.

I have only found one previous reference to "Ménière's disease" treated by the electrophonoid method—viz., one case reported by Dr. A. Ferguson in 1927.[5] From a list of about 20 personal cases treated by the Zünd-Burguet method alone, I selected seven for following-up and for a more detailed consideration of symptoms. It is unnecessary to give the clinical histories of these cases here, but it will be sufficient to state that the end-results were extremely satisfactory. After intervals varying from two to eight years, during which time no medicinal or other treatment was given, these patients have remained free from attacks of vertigo, although the other two symptoms of the triad—viz., deafness and tinnitus—were not necessarily relieved.

As the obstinate and chronic nature of this complaint is so constantly stressed in medical text-books, I can only attribute these results to the treatment which was given, and I should find it difficult to invoke any question of spontaneous subsidence of the attacks.

For details about the electrophonoid vibromassage treatment, for a description of the apparatus, and for an explanation of its action on the ear organ, I refer the reader to M. Zünd-Burguet's "Principes d'Anacousie" [4] and to Dr. Cathcart's book [3] and articles. As nerve deafness and tinnitus are often benefited, it seemed a natural step to use the treatment in such a purely labyrinthine disturbance as the Ménière symptom-complex.

I must emphasis a few points in connexion with t electrophonoid vibromassage which apply particula when this treatment is given to a patient w complains of Ménière attacks.

As a general rule, the treatment is applied to one e only, after one has decided where the disturbance is. T treatment may be begun as soon after an attack as o wishes. At first the patient may be still very unstead and may have to be led to one's consulting room. Af four or five treatments the unsteadiness has gone and h will come by himself. The heaviness in the head an indefinite neuralgic pains disappear, the tinnitus may g the hearing may or may not improve, but the vertig definitely vanishes and does not recur in the majority o cases.

At the first treatment it is necessary to start with ver low intensities, otherwise vertigo may be caused at the tim and the patient loses confidence. I begin with a treatme of about two minutes, but after three or four sittings th full six minutes' treatment may be given. The treatment are either daily or at longer intervals—e.g., four during week. A course of treatment for a case of Ménière' syndrome may require 10 or 15 or 20 attendances, but hardl ever more, as the response is remarkably quick.

If attacks of vertigo begin to appear again, a secon course of treatment may be given after three or four month or after longer intervals. Among the seven cases mention previously only one required a second course of treatme for recurring attacks of giddiness.

Serious labyrinthine operations are sometim advised when a patient is found to suffer from inc able vertigo, or remains subject to constant atta for years.[6] [7] [8] I submit that no case should e be allowed to undergo operation until the Zü Burguet electrophonoid treatment has been give thorough trial. In my experience it has proved be a most valuable remedy for the relief and cure the Ménière syndrome.

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AORTIC DIASTOLIC THRILLS.

REPORT OF A CASE.

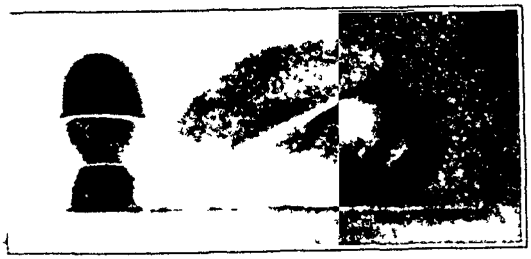
BY GEOFFREY BOURNE, M.D., F.R.C.P. LON
ASSISTANT PHYSICIAN TO ST. BARTHOLOMEW'S HOSPITA
PHYSICIAN TO KING GEORGE'S HOSPITAL, ILFORD.

MURMURS and thrills, as physical signs, ar often capable of definite and clear explanation, when full post-mortem correlation is possible. is especially true of aortic diastolic thrills.

Gee [1] states: "There is no kind of valvular d of the heart which may not produce a thrill"; White,[2] in his book, "Heart Disease," states: diastolic thrill is very rare except for that d mitral stenosis. At the base of the heart, bes along the left border of the sternum, a diastolic with marked aortic regurgitation occurs with infrequency."

It is possible that, by errors in timing, a c number of such diastolic thrills are missed by labelled systolic, and are wrongly regarded as cating aortic stenosis. The first patient exhi an aortic diastolic thrill observed by the write an out-patient at the East London Hospit Children, Shadwell. This child was sent to Dr. Drysdale, then examining for the L.R.C.P.,

, latter condition, found frequently in weavers, ften spoken of as "weavers' bottom"—probably he moment an almost non-existent disease! It ɔmmon, I believe, in harvesters, from the friction jolting of the iron seat of the reaping machine. he accompanying photograph illustrates a case on ch I recently operated. The patient, a man of 50, ea-captain, had this swelling hanging from the it buttock for the last 20 years. It had been gnosed repeatedly as a lipoma, and being of no



ore importance than a double chin in the wrong ace had been allowed to remain undisturbed by rgeons all this time. The operation was an easy ie, and the cyst parted company with the ischium ithout difficulty. It weighed 2 lb. 10 oz.; the rcumference was 18½ in.; and the diameters were ½ and 6 in. It was moderately filled with fluid, id gave the impression to the touch of a rubber air-ıshion; hence its presence was probably a comfort ither than otherwise, although mechanically and ɔsmetically it was a nuisance; it was tending to lose over the anus.

I report the case as one of wrong diagnosis before peration, and secondly to show to what extent a ursa may enlarge and still be absolutely painless nd without symptoms. The third point of interest n the case was the fact that the patient's Wassermann eaction had been positive 30 years ago. Syphilitic ɔursitis occurs, but is usually bilateral. The photo-raph gives a rough idea of the size in contrast with he size of a hen's egg.

SPONTANEOUS RUPTURE OF AN ABNORMAL SPLEEN.

By Wilfrid Attlee, M.D. Camb., M.R.C.P. Lond.,

PHYSICIAN TO THE KING EDWARD VII. HOSPITAL, WINDSOR.

Spontaneous rupture of the normal spleen is extremely rare, and Hamilton Bailey[1] in 1929 was able to find only 11 recorded cases of the condition. Spontaneous rupture of the abnormal spleen is less uncommon, and as M. P. Susman[2] pointed out in 1927, most of the recorded cases have been associated with malaria, typhoid fever, pregnancy, leukæmia, and septic conditions of the skin. Nevertheless it is perhaps sufficiently rare even in these conditions to warrant the publication of the following case:—

A single woman, aged 23, a post-office assistant, complained on August 11th, 1930, of swollen glands in the neck, which she had had for three or four days. She looked ill, the temperature was 99° F. and pulse-rate 80. A chain of glands was enlarged on both sides of the neck along the posterior border of the sternomastoid, and the occipital glands on both sides were enlarged. They were all hard and not particularly tender, and there was nothing obvious in the throat or elsewhere to account for them. The spleen was not palpable and the axillary and inguinal glands were not enlarged.

On August 13th she still looked ill but complained of nothing except the glands in the neck. The temperature was 100° F. and the right tonsil looked very slightly red. Klebs-Löffler bacilli were absent from a swab and the leucocyte count was 20,100. On the 15th both tonsils were enlarged and red with exudation in the crypts, and the uvula was œdematous. On the 16th the right tonsil and uvula were more swollen, and the appearance suggested the beginning of a quinsy. By the 19th the throat was less red and the organisms of Vincent's angina were reported on a swab.

On August 20th she collapsed after defæcation following a dose of Epsom salts. She looked very ill, with temperature 100° and pulse-rate 120, but complained of nothing but faintness. The abdomen was distended and tympanitic and a little tender on both sides. Sir Joseph Skevington who saw her with me found, on rectal examination, a tender spot in the pelvis, high up on the right side, and she was admitted to hospital as possibly a case of appendicitis. She improved considerably during the next two days, but the temperature continued between 100° and 101° with pulse-rate 92 to 100, and the rectal tenderness persisted.

On August 22nd Sir Joseph Skevington made a right paramedian incision for appendicectomy and the pelvis was found to be full of dark blood. The appendix was normal, as were tubes, ovaries, and uterus. Fresh blood welled down from the upper abdomen, and on exploration the spleen was found to be enlarged and ruptured. A left paramedian incision was then made in the upper abdomen and splenectomy was performed. The spleen was soft, about three times its normal size, and ruptured.

A blood count by Dr. E. C. Malden on August 23rd gave the following results:—

Red cells..	.. 2,180,000	Polymorph. ..	.. 69%
White cells	.. 21,250	Lymphocytes..	.. 26%
Hæmoglobin	.. 51%	Hyalines ..	.. 4%
		Eosinophils ..	.. 1%

On Sept. 2nd the red cells were
white cells 17,500, and the hæmo
On the 27th the count was: r
white cells, 8800; Hb. 74 per c Professeur de Clinique
Convalescence was uninter l'Hôtel-Dieu, Membre de
pleural effusion which deve e. Paris: Masson et Cie.
and cleared up by itself. 5.
and in October last, 14
was in apparently perf w work is a further testimony
count by Dr. Malden (O le industry. Both minor and
described in detail, and almost
Red cells .. 3,086, author's exceptional experience
White cells .. 13, rgery and his deep knowledge
Hæmoglobin .. 1(

nosing proctitis, of which the
Dr. E. ff. Creed, who ses, is a particularly notable
the spleen, reported that scussed in detail, together
unusual number of polymo of treatment. Prof.
well as a number of myelocyti by amputation of the
picture corresponded with that sphincters; the
acute pyogenic infections. nd the functional
good. A

The New Freemasons' Hospital.—At the annual meeting of the Freemasons' Hospital and Nursing Home last week it was stated that in the past year "the present little hospital" had admitted the record number of 681 patients. It had been decided to provide in the new buildings, the dedication stone of which is to be laid by the Duke of Connaught on May 19th, a total of 180 beds, and to open two wards for small children. The naming of beds in the new hospital has been so popular that the whole of the 96 available for naming have been taken up at £1000 each. Several single-bed wards will be named at £1500 each. During the year ended with June last, a little over £106,000 had been given, with a further £29,000 to Dec. 31st. The contract for the complete hospital was £313,000, but many improvements in the original scheme have been suggested involving an additional appeal for £75,000, and it has been decided to postpone work on the western wing for the time being.

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[1] Brit. Jour. Surg., 1929–30, xvii., 417.
[2] Ibid., 1927, xv., 47.

CLINICAL AND LABORATORY NOTES

THE TREATMENT OF OCULOGYRIC CRISES IN CHRONIC EPIDEMIC ENCEPHALITIS.

BY H. ASTLEY COOPER, M.B. LOND.,
ASSISTANT MEDICAL OFFICER, WEST PARK MENTAL HOSPITAL, EPSOM, SURREY.

OF the 80 patients at the West Park Mental Hospital suffering from encephalitis lethargica, 12 were found to have oculogyric crises, either alone or associated with conduct disorders. McCowan and Cook[1] found that hyoscine, gr. 1/100 hypodermically, cut short the attacks, and that *oral* and hypodermic hyoscine both reduced the incidence of attacks if given regularly. It has been our recent practice here to use tinct. stramonii, in doses up to ♏ 90 t.d.s., as the standard drug in parkinsonian cases. It has been found more efficient than hyoscine. But our experience agreed with that of Hall[2] that, though the frequency might be reduced or a particular attack cut short, no cases ceased altogether to have the oculogyric crises.

Other drugs were therefore tried: potassium bromide, luminal—alone or in combination—and impletol. The following are brief notes on the cases.

CASE 1, female. Primary attack 1921. Unable to work on account of crises. Usual incidence 7–8 days, preceded by obsessional nonsense phrases interrupting any thought. Pot. brom., grs. 10 t.d.s., stopped attacks entirely. Tinct. stramonii, ♏ 15 t.d.s., administered throughout, had no effect on the attacks.

CASE 2, female. Primary attack 1927. Moderate parkinsonism. Usual incidence of crises 2–3 days' interval. Tinct. stramonii, ♏ 60 t.d.s., improved parkinsonism markedly, but had no effect on crises. Pot. brom., grs. 10 t.d.s., reduced attacks to eight a month, but bromism stopped treatment. Luminal, gr. 1, reduced attacks to five a month. Luminal, gr. ¾ b.d., reduced attacks to four a month. The tinct. stramonii was kept constant throughout.

CASE 3, male. Primary attack April, 1923. Marked parkinsonism and frequent oculogyric attacks on admission 1927. On tinct. stramonii, ♏ 90 t.d.s., he had about two attacks monthly over two months. Reported to be his usual rate. He also frequently had outbursts of acrobatic exhibitionism. Pot. brom., grs. 10 t.d.s.; two attacks a month; no change in acrobatics. Luminal, gr. 1 nocte. two attacks and ten acrobatic attacks in month. Pot. brom., grs. 10 t.d.s.; luminal, grs. 1½ nocte; no further crises; four acrobatic attacks in month. More settled mentally. Tinct. stramonii unaltered throughout.

CASE 4, female. Primary attack 1924. Advanced parkinsonism. Oculogyric crises, three in ten days, but apparently then ran in groups. 1931: attacks alternate days, 14–15 monthly, in spite of tinct. stramonii, ♏ 90 t.d.s. Attacks could be stopped within 20 minutes by hyoscine, gr. 1/100. Pot. brom., grs. 10 t.d.s., reduced attacks to five or six a month. Luminal, grs. 1½ nocte, reduced them to nine a month. Tinct. stramonii was constant throughout.

CASE 5, female. Primary attack 1924. Advanced parkinsonism, with screaming attacks weekly. Definite oculogyric crises rare, usually fixity of eyes only. Tinct. stramonii, ♏ 90 t.d.s.; frequency of screaming attacks appeared to be less, according to notes of case, but they did not stop. Pot. brom., grs. 10 t.d.s., had no effect. Luminal, gr. 1 nocte, had no effect.

CASE 6, female. Primary attack 1920. Moderate parkinsonism. Paranoid psychosis. Tinct. stramonii, ♏ 60 t.d.s., had no effect on crises. Pot. brom., grs. 10 t.d.s., reduced attacks from seven or eight to four a month.

CASE 7, female. Primary attack 1919. Advanced parkinsonism. Usual rate of crises seven or eight a month. Tinct. stramonii, ♏ 90 t.d.s., produced no change in crises. Pot. brom., grs. 10 t.d.s.; no further crises, but patient developed spasmodic torticollis; the attacks have not recomm since discontinuing the bromide.

CASE 8, female. Primary attack 1927. Moderate pa sonism. Usual rate of crises twice daily. Tinct. stram ♏ 90 t.d.s., reduced attacks to seven a month. Pot. b grs. 10 t.d.s., reduced them to two to four a month.

CASE 9, male. Primary attack 1921. Advanced pa sonism, with maniacal outbursts in association with o gyric crises. Incidence about seven or eight a m Tinct. stramonii, ♏ 90 t.d.s., and luminal, gr. ¾ n produced no change in incidence.

CASE 10, male. Primary attack 1924. Advanced pa sonism. Fits of weeping and howling with self-mutila weekly, with oculogyric crises. Tinct. stramonii, ♏ 90 t produced no change in attacks, nor did pot. brom., gr t.d.s., or luminal, gr. 1 nocte.

CASE 11, female. No history of primary attack. O gyric crises since 1927. Moderate parkinsonism. Tw three screaming fits weekly in association with c Tinct. stramonii had no effect. Nor did luminal, gr nocte or b.d.

Summary of Cases.—Eleven cases were tried bromide or luminal. One stopped altogether, five had less frequent attacks, one of these not ha had any more attacks. These six were all simple c without behaviour disorders of a gross type in a ciation with the fits. Of the five "apache typ one was improved in behaviour and his crises cea The other four were not improved.

The cases recorded are considered to be interes as a basis for further investigation, but the seri small, and the susceptibility of these patient suggestion has been previously noted. While a si substitution of, for instance, water for hyos hypodermically may succeed in relieving sympt the patients are not usually to be deceived tw moreover, they usually hold definite ideas on merits of various drugs, and can often describe defects of new drugs as compared with prev ones. We regard the period of observation as s safeguard against suggestion effects.

My conclusion is that potassium bromide luminal are definitely useful in reducing the incid of oculogyric crises, and may occasionally them.

In view of the above results, and the heada which Case 4 has in many of her crises, impletol also tried in three cases as a means of aborting eye crisis. No effect was obtained with it, when the dose was repeated in 15 minutes. Impl therefore, is no use in oculogyric crises.

My thanks are due to Dr. Norcliffe Roberts fo interest and assistance in this work.

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[1] McCowan, P. K., and Cook, L. C.: Brain, 1928, i., 1316.

[2] Hall, A. J.: Brit. Med. Jour., 1931, ii., 833.

A VERY LARGE BURSA.

BY IAN FRASER, M.CH. BELF., F.R.C.S. ENG. F.R.C.S. IREL.,
HON. ASSISTANT SURGEON, BELFAST HOSPITAL FOR SICK CHILDREN.

ENLARGEMENT of the bursa placed over the isc tuberosities is a well-recognised entity. Irrita or intermittent pressure may cause a mild de of traumatic bursitis with resultant swelling enlargement of these bursæ. The swelling is a rule of the ordinary serous type, but in many ca solid enlargements occur, and if much surround fibrosis has taken place the operation for t removal may be a tedious and difficult dissecti latter condition, found frequently in weavers, en spoken of as "weavers' bottom"—probably e moment an almost non-existent disease! It amon, I believe, in harvesters, from the friction olting of the iron seat of the reaping machine.

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On August 13th she still looked ill but complained of nothing except the glands in the neck. *The temperature* was 100° F. and the right tonsil looked very slightly red. Klebs-Löffler bacilli were absent from a swab and the leucocyte count was 20,100. *On the 15th both tonsils* were enlarged and red with exudation in the crypts, and the uvula was œdematous. On the 16th the right tonsil and uvula were more swollen, and the appearance suggested the beginning of a quinsy. By the 19th the throat was less red and the organisms of Vincent's angina were reported on a swab.

On August 20th she collapsed after defæcation following a dose of Epsom salts. She looked very ill, with temperature 100° and pulse-rate 120, but complained of nothing but faintness. The abdomen was distended and tympanitic and a little tender on both sides. *Sir Joseph Skevington* who saw her with me found, on rectal examination, a tender spot in the pelvis, high up on the right side, and she was admitted to hospital as possibly a case of appendicitis. She improved considerably during the next two days, but the temperature continued between 100° and 101° with pulse-rate 92 to 100, and the rectal tenderness persisted.

On August 22nd Sir Joseph *Skevington made a right* paramedian incision for appendicectomy and the pelvis was found to be full of dark blood. The appendix was normal, as were tubes, ovaries, and uterus. *Fresh blood welled* down from the upper abdomen, and on exploration the spleen was found to be enlarged and ruptured. A left paramedian incision was then made in the upper abdomen and splenectomy was performed. The spleen was soft, about three times its normal size, and ruptured.

. A blood count by Dr. E. C. Malden on August 23rd gave the following results:—

Red cells..	.. 2,480,000	Polymorph. ..	.. 69%
White cells	.. 21,250	Lymphocytes..	.. 26%
Hæmoglobin	.. 51%	Hyalines ..	.. 4%
		Eosinophils ..	.. 1%

On Sept. 2nd the red cells were [illegible] white cells 17,500, and the hæmog [illegible] On the 27th the count was: r [illegible] white cells, 8800; Hb. 74 per c [illegible] [illegible] ence was uninter [illegible]

Professeur de Clinique [illegible] l'Hôtel-Dieu, Membre de l'Académie [illegible] ne. Paris: Masson et Cie. 1931. Pp. 398. Fr. 75.

Prof. Hartmann's new work is a further testimony to the author's laudable industry. Both *minor and* major conditions are described in detail, and almost every page reveals the author's exceptional experience in this branch of surgery and his deep knowledge of the literature.

The chapter on stenosing proctitis, of which the author has had 120 cases, is a particularly notable one: the pathology is discussed in detail, together with the varying methods of treatment. Prof. Hartmann has treated 56 cases by amputation of the rectum with preservation of the sphincters; the mortality works out to 4 per cent., and the functional results appear generally to be extremely good. A bibliography of more than three pages concludes this chapter. Cancer of the rectum is the subject of an imposing essay of more than 100 pages. The perineal and abdomino-perineal excisions, together with their modifications, are discussed. Prof. Hartmann describes a perineal excision of the rectum with the removal of the sphincters and the formation of a perineal anus, slightly posterior to the normal position. Details are given of 75 cases which were followed up after this operation; a certain degree of incontinence and prolapse were not uncommon. The mortality of this operation is estimated as 14 to 16 per cent.; the late results show rather a high incidence of local recurrences which have frequently necessitated a colostomy later. It is difficult to

(*Continued from previous page.*)

attendant to wait for signs of pneumonia. If signs are waited for, then we may wait for death to occur before the signs show themselves. By some people alkaloids are ordered, one for each separate symptom. This is a bad method of treating such cases. Far better with some old and tried medicine to anticipate symptoms, and prevent worse ones occurring.

Since the exhibition of boric crystals, which are used to fill up the wound, there has not been a case at Guy's Hospital of sloughing of the wound, but if it does occur, then there are two important items of treatment. The sloughs should never be forcibly removed. Such a procedure will only lead to further infection of the wound, and perhaps the death of the patient. It is possible that this sloughing may follow the use of indiarubber drainage-tubes, for such tubes contain free sulphur, which has its uses in certain septic urinary cases, but is not wanted after prostatectomy. The second item is this: such sloughing, especially if the slough be grey or black, may indicate that the patient is dying.

Among other points mentioned in the address, Mr. Thompson said that in a certain number of cases it is important that the wife should be kept away from the patient for two or three days after the operation, and that directly the patient is to be allowed up a carefully fitted suspensory bandage should be properly applied, as it is not unknown for orchitis to occur sometime after the operation, and even when the patient has gone home.

CLINICAL AND LABORATORY NOTES

THE TREATMENT OF OCULOGYRIC CRISES IN CHRONIC EPIDEMIC ENCEPHALITIS.

By H. Astley Cooper, M.B. Lond.,
ASSISTANT MEDICAL OFFICER, WEST PARK MENTAL HOSPITAL, EPSOM, SURREY.

Of the 80 patients at the West Park Mental Hospital suffering from encephalitis lethargica, 12 were found to have oculogyric crises, either alone or associated with conduct disorders. McCowan and Cook[1] found that hyoscine, gr. 1/100 hypodermically, cut short the attacks, and that oral and hypodermic hyoscine both reduced the incidence of attacks if given regularly. It has been our recent practice here to use tinct. stramonii, in doses up to ♏ 90 t.d.s., as the standard drug in parkinsonian cases. It has been found more efficient than hyoscine. But our experience agreed with that of Hall[2] that, though the frequency might be reduced or a particular attack cut short, no cases ceased altogether to have the oculogyric crises.

Other drugs were therefore tried: potassium bromide, luminal—alone or in combination—and impletol. The following are brief notes on the cases.

Case 1, female. Primary attack 1921. Unable to work on account of crises. Usual incidence 7–8 days, preceded by obsessional nonsense phrases interrupting any thought. Pot. brom., grs. 10 t.d.s., stopped attacks entirely. Tinct. stramonii, ♏ 15 t.d.s., administered throughout, had no effect on the attacks.

Case 2, female. Primary attack 1927. Moderate parkinsonism. Usual incidence of crises 2–3 days' interval. Tinct. stramonii, ♏ 60 t.d.s., improved parkinsonism markedly, but had no effect on crises. Pot. brom., grs. 10 t.d.s., reduced attacks to eight a month, but bromism stopped treatment.
Luminal, gr. 1, reduced attacks to five a month. Lum
gr. ¾ b.d., reduced attacks to four a mon may lead
stramonii was kept constant throug wound, and secondly,

Case 3, male. Primary at rs 1910 to 1916, syphilis
parkinsonism and frequent oc
sion 1927. On tinct. stramonii, gether in 20 per cent.
two attacks monthly over two ction, exacerbations of
his usual rate. He also frequen an operation as supra-
batic exhibitionism. Pot. brom., g
month; no change in acrobatics.
two attacks and ten acrobatic a equently used in the
brom., grs. 10 t.d.s.; luminal, gr 's Hospital, in order
crises; four acrobatic attacks in ent symptoms, and
mentally. Tinct. stramonii unalt ever regretted its use.

Case 4, female. Primary attac theter twice a day may
sonism. Oculogyric crises, thre wers of the kidneys and
then ran in groups. 1931: more suitable for operation.
monthly, in spite of tinct
could be stopped withi the bladder is distended with
Pot. brom., grs. 10 t t can be felt above the pubes,
month. Luminal,
month. Tinct catheter has been removed a light
is applied round the penis, and this is removed directly the bladder has been opened. When the bladder has been exposed a roll of gauze is carefully packed round the bladder, and the viscus itself is opened by a transverse incision. There is less bleeding when veins are cut across than when they are nicked, as may happen with the vertical incision, which is of course parallel to the course of the veins. Moreover, when the bladder is opened the peritoneum comes down into its usual position, and with a transverse incision through the bladder wall the incision can be lengthened if this be desired, much more safely than with a vertical cut. During the actual removal of the adenomata of the prostate, it is desirable that the patient should be deeply under the anæsthetic. Sir John Thomson-Walker has

spasmodic torticollis; the attacks have not recomm
since discontinuing the bromide.

Case 8, female. Primary attack 1927. Moderate park-
sonism. Usual rate of crises twice daily. Tinct. stram
♏ 90 t.d.s., reduced attacks to seven a month. Pot. bro
grs. 10 t.d.s., reduced them to two to four a month.

Case 9, male. Primary attack 1924. Advanced park-
sonism, with maniacal outbursts in association with ocu-
gyric crises. Incidence about seven or eight a mon
Tinct. stramonii, ♏ 90 t.d.s., and luminal, gr. ½ noc
produced no change in incidence.

Case 10, male. Primary attack 1924. Advanced parki
sonism. Fits of weeping and howling with self-mutilation,
weekly, with oculogyric crises. Tinct. stramonii, ♏ 90 t.d.s.
produced no change in attacks, nor did pot. brom., [illegible]
t.d.s., or luminal, gr. 1 nocte.

Case 11, female. No history of primary attack. [illegible]
gyric crises since 1927. Moderate parkinsonism. [illegible]
three screaming fits weekly in association with [illegible]
Tinct. stramonii had no effect. Nor did luminal, [illegible]
nocte or b.d.

Summary of Cases.—Eleven cases were tried o
bromide or luminal. One stopped altogether, a
five had less frequent attacks, one of these not havi
had any more attacks. These six were all simple ca
without behaviour disorders of a gross type in as
ciation with the fits. Of the five "apache type
one was improved in behaviour and his crises cea
The other four were not improved.

The cases recorded are considered to be interest
as a basis for further investigation, but the serie
small, and the susceptibility of these patients
suggestion has been previously noted. While a si
substitution of, for instance, water for hyos
hypodermically may succeed in relieving sympt
the patients are not usually to be deceived tw
moreover, they usually hold definite ideas on
merits of various drugs, and correct bla
defects of likely to work naturally and ph
logically than if it be anchored to the abdominal
An important point is also an anatomical one,
was first pointed out to the speaker by Mr. Le
of Mauritius. Across the very centre of the s
pubic wound there runs a deepish furrow, t
really a line of abdominal flexion, and this g
tends to open up the wound. Therefore, if
desired to close the wound as soon as possible
essential that the patient should lie flat upon his
at the end of a fortnight with a catheter in si
that the groove may be got rid of, with its ten
to open the wound, whilst the final process of
the wound is taking place.

If bleeding should occur after the operation
sometimes does, a good position for the pat
that in which the buttocks are raised, and t
and body depressed. This position cause
prostatic region to be much higher as far as
is concerned than it is usually, and thus the b
may be stopped. After the operation careful at
should be paid to getting the bowels open pr
For this purpose the laxative that the pat
accustomed to is given first, but if this fails to a
castor oil is given, and if this does not act t
enema terebinthinæ is given. Ileus mu
prevented, for it is very dangerous in itself, but
dangerous as indicating that the patient is
than may have been supposed, and that other
besides the bowels are failing. Therefore it n
treated assiduously. Apart from the ileus, a
occurs, in addition to it, the lungs must be at
to. There is too great a tendency for the

(*Continued at foot of opposite page.*)

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imagine that this operation can be as effective as the two-stage perineal excision with a permanent colostomy, which Lockhart-Mummery has described and performed with such success in this country. In discussing abdomino-perineal excision Prof. Hartmann expresses his belief that a terminal iliac colostomy is preferable to any attempt to bring down the pelvic colon to the anus, but it is evident that on the continent there is still a lingering tendency to perform operations which avoid colostomy. The results of 30 survivals from operation are given. Prof. Hartmann finds that recurrences as a rule show themselves within three years after operation, and working on this basis he estimates that his percentage of three-year cures is 56 per cent. (based on operation survivals). His actual operation mortality in recent years is not given. The operation of abdominal excision of a growth in the recto-sigmoidal region, with closure of the distal end, is described fully and well illustrated. This operation is very generally known as Hartmann's method, and the author's description of it, together with his personal results, deserves careful study. It is undoubtedly a valuable operation, and its soundness is based on careful anatomical researches.

This work contains sound and lucid surgical teaching given by a master of his art, and it will be studied with profit alike by specialist and general surgeon.

Modern Proctology.

By Marion C. Pruitt, M.D. Ga., F.R.C.S. Edin. London: Henry Kimpton. 1931. Pp. 404. 36*s*.

This book aims at giving a concise and comprehensive account of modern proctology. It is a curious mixture of good, bad, and indifferent. The good reflects the views of masters such as Cunningham, Ball, Tuttle, Bland-Sutton—nearly three pages are included on the subject of dermoids—Hill, Lockhart-Mummery, Rankin, and others. Mr. Pruitt's chapters in the early part of the book on constipation, fissure, abscesses, and hæmorrhoids are clear and adequate, and those on megacolon, stricture, and prolapse provide a sound summary of current opinion on these subjects.

It is in the later part of the book, where tumours are under discussion, that it becomes increasingly difficult to follow the author with interest or profit. Obsolete operations for cancer of the rectum are described and illustrated, such as perineal excision with preservation of the sphincters, Kraske's operation with the formation of a sacral anus, and vaginal excision of the rectum. The abdomino-anal excision is mentioned, but fortunately not described. Coffey's operation is reproduced, together with the usual illustrations. We must firmly oppose the author's contention that this operation is as effective as the one-stage operation of Mr. Ernest Miles. There are manifold reasons for believing that it is definitely inferior, and that some of the modifications, which involve section of the bowel and the trunk lymphatics, are not in accord with sound principles of radical cancer surgery. Throughout this section the only references to operation mortality are the figures published in the Ministry of Health Report in 1927, showing the operation mortality in relation to the height of the growth from the anus, and Coffey's report of his death-rate in 65 cases, which was published in Yeoman's text-book. As regards end-results, Rankin and Broders' table, showing the duration of life according to the malignancy grading, is reproduced, and there are figures relating to a series of 55 cases treated by lead injections; bu apart from this the author has no information to offer regarding prognosis after the different exci operations which he has described, nor has he referred to any of the recent papers published on the subject

In the discussion of resection of the pelvic colo we find a prominent row of Murphy's buttons depicted on p. 338, but there is no mention of the value of cæcostomy as an adjunct to end-to-end anastomo Paul's operation for extraperitoneal resection of the colon is described, but Rankin's method of obstructive resection and Devine's modification are not referred to. The description of the removal of a large adenoma from the rectum is so concise as to be almost without value, since the operation of posterior proctotomy is full of difficulty and many important details must be considered, while the importance of repeated and regular re-examination of such patient after operation is not stated.

Many of the illustrations have only historic interest, and others are so small and indistinct as t be of little value. The book leaves the impressio that the author's desire to present a complete encycl pædia on proctology led him to describe maj conditions of which he has little first-hand experienc This would be of less importance had his gleanin from the literature been made with discretion, a had full references to original papers been suppli

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Surgical Pathology of the Genito-urina Organs.

By Arthur E.. Hertzler, M.D., Surgeon to Agnes Hertzler Memorial Hospital, Halste Kansas; Professor of Surgery, University Kansas. London: J. B. Lippincott Co. 1 Pp. 286. 21*s*.

While anatomy has always been recognised necessary foundation for surgical knowledge, i only during the last 50 years that a knowledg pathology has come to be considered of equal imp ance to a practical surgeon. Hertzler's work surgical pathology provides the operator with valu information which otherwise he would be comp to seek in books on general pathology which with every aspect of the subject. The third tre on regional pathology to appear under this ge heading is concerned with the genito-urinary or the other two being on the diseases of bones, an the skin, fasciæ, muscles, blood-vessels, and ly vessels. Seven other volumes are being prep and the complete series will thus consist of volumes. The fact that the volumes are not iso monographs enables the common factors of gro affecting the various systems to be made clear, and the editor is a general surgeon his wise judgme a safeguard against the evils of over-specialisa The ideal that the genito-urinary specialist sh have a sound general knowledge of the dis affecting the whole of the body while possessi special knowledge of those of the kidney, bla and genito-urinary tract is evidently held by Hertzler. He is himself a surgeon as well as a p logist, and it is therefore unnecessary to say th approaches his subject from the angle of pr rather than that of theory. His work is enriche 222 excellent illustrations, the great majorit which are from photographs of material obt from the Agnes Hertzler Memorial Hospital, Hals Kansas.

THE LANCET.

LONDON: SATURDAY, FEBRUARY 6, 1932.

THE SPAHLINGER REMEDIES.

IN the winter of 1913–14 the late Dr. ARTHUR LATHAM collaborated with Mr. HENRY SPAHLINGER in the treatment of a number of cases of pulmonary tuberculosis at teaching hospitals in London and in Dr. Latham's private practice. The treatment was with vaccines and serums prepared by methods, not then made public, at Mr. Spahlinger's bacterio therapeutic institute at Carouge, near Geneva, where he had an experimental farm and a laboratory well equipped for serological and bacteriological research. The war intervened, during which the institute at Carouge was diverted to other purposes, and it was not until some ten years later that the Spahlinger treatment was heard of here. Mr. Spahlinger set out his claims for the cure of tuberculosis in his own words in our issue of Jan. 7th, 1922, and the British Red Cross voted a large sum of money to enable him to produce his remedies so that they might be tried in this country, while the Ministry of Health offered facilities for their experimental trial under scientific supervision so soon as supplies were available for the purpose. We ourselves appealed to Mr. Spahlinger to submit to the independent investigation of his remedy at one or other of the research institutes in this country, but, as our readers are aware, this appeal was unavailing, although we pursued for many months a policy of printing (without curtailment or comment) all cases, successful or unsuccessful, treated by this method, when submitted to us by medical men. In 1927 we published a review of the cases treated in 1913–14 at St. George's Hospital, with a clinical record setting out their subsequent history, and we took the opportunity again of appealing to Mr. Spahlinger to submit his remedies to the independent investigation which the Ministry of Health was still offering. The position varied but little until about a year ago, when the results were published of a test made at a Norfolk farm on the immunisation of calves against tubercle with a single dose of simplified bovine vaccine provided by Mr. Spahlinger; the committee of control included two veterinary surgeons who were satisfied that this vaccine conferred on calves an extremely strong resistance against tuberculosis. This vaccine was said to be prepared from dead germs and was not more nearly described.

The situation is now, however, changed, for, as will be seen from his letter to our correspondence columns, Mr. Spahlinger has made a statement of his method for the preparation of antigens, whether for the preventive vaccination of human beings or for cattle against tuberculosis. The details will be found set out word for word as he has communicated them to us on page 309 of our present issue. In this memorandum there are lacunæ which we hope will in due course be filled up. The salient points, however, may be enumerated as follows. In the preparation of the bovine vaccine primary cultures are made direct from slaughter-house material without preliminary passage through animals, and, presumably, without treatment with acid or alkali to destroy any stray secondary organisms, such as is the usual practice nowadays. The media on which the primary cultures are made consist of a mixture of heated and unheated "defibrinated blood, serum, organ or tissue extract" from a bovine source. The ingenious method of applying the unheated portion to the surface of the coagulated medium is an elaboration of a method of applying fresh blood to the surface of an agar slope devised years ago for cultivating the pneumococcus. Koch used coagulated serum in his early experiments on the cultivation of the tubercle bacillus, but nowadays we believe most bacteriologists have relinquished serum in favour of egg media on which primary implantations appear to do better. Tissue extract has occasionally been tried but has been very little used by tuberculosis workers. Mr. Spahlinger does not state what tissues or organs he uses and gives no details as to his methods of extraction, filtration, &c. The first subcultures are preferably made on liquid media of the same substances. Here again no details are given as to the method of preparing the tissue extracts or as to their strength, but later in the memorandum it is stated that in cultivating the human strain small amounts of saline, glycerin, or glucose may be added. As a rule in most laboratories we believe first subcultures are made on solid media and continued thereon till the cultures grow readily. In making the vaccine emulsion from the subcultures, Mr. Spahlinger tells us that the "tubercle micro-organisms are collected and made into an emulsion in a sterile manner, in the absence of oxygen, with distilled water or normal saline solution." No details are given as to the method of removal of oxygen, but we presume the emulsion is treated in vacuo. Also—and this is an important omission—Mr. Spahlinger does not state the method of estimating the strength of the bacterial emulsion he employs. After distribution of his emulsion into ampoules the organisms contained therein are left to die a natural death by the efflux of time—which takes a year or even longer. This, we believe, is a new departure. Many physical and chemical methods have been

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nism. The idea of cause and effect being solubly and invariably related in exactly the me way has grown weaker; it seems not unlikely at their connexion is one of probability rather an certainty, as Prof. KARL PEARSON suggested ng ago in "The Grammar of Science." When e deal with the phenomena of chemistry and ysics where in general innumerable units are ncerned, the exceptional result is overwhelmed y the average and is imperceptible. In biology, here we can observe isolated units, we can see dividual results and it becomes apparent that he same cause is not always followed by exactly he same effect. Atoms might well have the same egree of free-will if we could study them by hemselves. Prof. CLARK therefore finds nothing in xperimental science which is antagonistic to or ncompatible with the appreciation of spiritual alues. A further testimony to the same effect ill be found in a very striking document by Sir DANIEL HALL, the distinguished agriculturist, printed in the December number of the *Nineteenth Century and After*. Telling us the tale of his personal pilgrimage, he confirms the general experience that the mind instinctively demands some scheme which will reconcile the spiritual and mechanical facts of observation. It was in Berkeley's argument for the non-existence of material things that he found an escape from the difficulties of a mechanical conception of the universe and from the dilemma of free-will and determinism. If the ultimate reality is mind, the laws of the universe which we formulate are no more than modes of thought and they may very well appear to be inconsistent among themselves because our minds are only fragments of the whole mind: they are aspects of reality, not reality itself. Hence, too, our observations of the spiritual side of life are just as real as our records of the material world. Disinterestedness is simply an observed fact of human conduct and righteousness is just as much a human quality as intelligence. Both are fitful in their operations, irregular in their distribution, and unequal in their intensity, but their existence is a fact of observation as valid as any mechanical measurement; no account of the universe can neglect them without being obviously incomplete.

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THE TREATMENT OF TOXIC DIPHTHERIA.

DIPHTHERIA is a preventable disease. Where, as in New York City,[1] active immunisation is carried out upon an adequate scale, morbidity and mortality have declined notably. In this country active immunisation is at last making headway, but so far the numbers of children protected are too small to produce any appreciable effect upon prevalence. Case-mortality, on the other hand, has been declining for a generation. Without doubt, diphtheria antitoxin has been the main factor, but not the only factor, in bringing about the great fall in the fatality-rate. The fatality-rates of other common acute infectious diseases, for which no specific measures of treatment are available, have also steadily declined within the same period. Discussion of the causes of this general decline is beyond our present purpose. Case-mortality from diphtheria in this country now ranges from about 4 to 6 per cent., varying somewhat in different years and in different towns. Fatalities in diphtheria are almost entirely accounted for by the laryngeal form and by the toxic faucial case. Whatever the reasons, there can be no question that the proportion of severely toxic cases of the disease varies in different epidemics in the same city and in different cities at the same time. Berlin a few years ago experienced an epidemic of diphtheria during which cases of toxic type occurred in alarming numbers. In Hamburg, on the other hand, at the same period, diphtheria was neither unduly prevalent nor exceptionally severe.

Cases of faucial diphtheria have been encountered in whose treatment diphtheria antitoxin, although administered early and in adequate dosage, is stated to have been of no avail. Toxæmia from the first was apparently overwhelming. But such cases must be very exceptional. Very many more cases, unfortunately, are daily met with where prompt injection of a moderate dose of antitoxin might have averted that tragedy of infectious diseases hospitals—the case of toxic diphtheria which comes under treatment too late. All admit the necessity for antitoxin in the treatment of diphtheria and the prime importance of its early administration. Most, perhaps, are now agreed that in the severe case of diphtheria a portion, at any rate, of the dose should be injected intravenously. As to the size of the dose, the number of units, there are many differences of opinion. V. BIE, of Copenhagen, who claims that his low case-mortality is due to the use of very large doses,[2] has injected an aggregate dose of 500,000 antitoxic units; W. H. PARK, of New York, a strong upholder of the intravenous route, would not exceed at most 50,000 units; E. W. GOODALL's upward limit is 30,000 units. In some late cases of toxic diphtheria no dose of antitoxin of whatever magnitude is of any avail. Antitoxin can only adsorb circulating toxin and possibly toxin but loosely fixed in the tissues. It cannot repair structural damage.

On another page appears a paper by Drs. BENN, HUGHES, and ALSTEAD upon the treatment of toxic diphtheria by combined antitoxin and dextrose-insulin therapy. As they point out, F. F. SCHWENTKER and W. W. NOEL, in the course of a comprehensive reinvestigation of the causes of circulatory failure in diphtheria, have produced evidence, from their own observations and those of others, that the toxin of diphtheria causes profound changes in carbohydrate metabolism. In the severe case there is at first a rise in the blood-sugar which is due to an increased glycogenolysis, glycogen disappears from the liver and, most significantly, from the bundle of His employed in the past for this purpose, but we do not recollect having read of this. Each batch of vaccine is tested before use to be quite sure that no living tubercle bacilli remain. In the case of vaccine for use in man there are added to the bovine vaccine (*a*) a vaccine of bovine bacilli grown on media from human sources, (*b*) of human bacilli grown on media from human sources, the media being prepared from "defibrinated blood, serum, ascitic or pleural fluids" which must be taken from "tuberculous-free bodies." Details of preparation are not given. The question of dosage of the vaccine is not dealt with in the memorandum, but it is stated that the relative proportions of the three types of culture used in the vaccine for man "vary according to the nature of the particular type of the tuberculous disease."

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[1] Report of Commissioner of Health for New York City, 1931.

[2] See THE LANCET, 1928, ii., 21.

Now that Mr. Spahlinger has given to the world this much of his methods we hope that he will be persuaded to give full working details and especially to fill some of the lacunæ we have pointed out. The formula has been released, we are told, through the generosity of a small group of public-spirited people who are animated by humanitarian motives but wish to avoid the possibility of improper exploitation of the remedies. The Therapeutic Substances Act should be a sufficient guarantee against their fear of cheap and hasty manufacture. Mr. Spahlinger may safely join the freemasonry of bacteriologists who share their knowledge for the benefit of medicine and mankind.

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THE PHILOSOPHY OF BIOLOGISTS.

THE aim of scientific workers, in so far as they have had any definite formulated aim at all, has always been to construct a logical coherent systematic explanation of the world as they perceive it, in which effects follow causes with such implacable regularity that the one may with certainty be deduced from the other. Since each effect must in its turn be a cause, such a world *obviously consists of a predetermined procession*, and it is very difficult to harmonise it with the belief innate in every human being that he has at least some control over what he does and that what he does makes a difference. We doubt whether the majority of those who are interested in natural knowledge ever pose this dilemma to themselves. Absorbed in the problem of the moment, they do not spend much time in reflecting on their ultimate aims, nor does it occur to them that the more they expose the predestined chain of events at which they happen to be working, the more they undermine the position of the free-will on which, as they would doubtless say, their progress depends. But if in moments of being by themselves the matter does happen to occur to their consideration, they must needs recognise that the dilemma is a real one of which there is no ready solution. Prof. A. J. CLARK, of Edinburgh, made it the text of a discourse he gave last autumn to the Quaker Medical Society which is published in the current number of the *Friends' Quarterly Examiner*, and he gives us an interesting survey of the problem of vitalism versus mechanism as it appears to one who has spent his scientific life in the rigorous examination of the properties of living tissues by the analytical methods of experimental physiology.

On the whole, Prof. CLARK is entirely dissatisfied with the attempts which have been made to explain life in terms of chemistry and physics. He freely admits that very substantial progress has been achieved in working out the physico-chemical basis of many of the mechanisms which are found operating in live animals, though even here he points out that some of these explanations fail t account for the phenomena while others have been based on conceptions of the inorganic world whic have turned out to be fallacious. But the essenti difficulty is that the discovery of living mechanism has not brought us much nearer the discovery life, and in this criticism he reaches the point which mechanist and vitalist part company. Wh an animal does is, according to the mechani determined by the available mechanisms; to vitalist, these mechanisms are no more than t means by which the animal reaches its objec In homely simile, the mechanist would hope explain why Jones goes from Piccadilly Circus the Bank by a quantitative study of the vari means of transport which are available; these of quite subsidiary interest to the vitalist who in them nothing but a series of alternative mech isms which do not help us at all to underst why Jones starts in one place and ends up in other. Life in short is something more than the sum of the activities into which organisms can be dissected, and he quotes SMUTS'S summary with approval: "the nature of living things is determined, not by the nature of their parts, but by the nature or principle of their organisation"; mechanism does nothing to explain the correlation and coördination which are so characteristic of organisms. Prof. CLARK also objects to determinism because it denies all significance to consciousness and, as he says, we are more certain of *the* existence of *consciousness than* we are of any other fact. Evidently he has no sympathy with those who would solve these troubles by cutting human experience into two halves which may roughly be called the material and the spiritual; man is essentially a religious animal and no explanation of life is satisfying which does not take this into account. The mechanistic method of approach should be given up and the biologist should concentrate on discovering not the features which living organisms share with dead matter, but the features in which the two differ. Only in this way, he says, shall we obtain a just view of what the properties of life really are.

It may be suggested in commentary that the difficulties indicated by Prof. CLARK are perhaps less than they used to be. Modern physics has gone some way to assimilate its conceptions to those of biology and the distinction between liv and dead has *become* less definite; it seems possible, indeed, that *everything* from the electro to man might go into a series graded quantitatively rather than qualitatively. So too with deter

ANNOTATIONS

THE HEREDITY OF DIABETES.

HEREDITY has been recognised as an ætiological tor in diabetes since the sixteenth century, but I. S. Wright reminds us.[1] H. A. H. Howard d P. J. Cammidge were the first to show at a high blood-sugar might be transmitted in ice according to Mendelian law. They found at if certain mice having a high fasting blood-gar were mated they produced offspring having e same high blood-sugar; if, on the other ınd, they were crossed with mice having normal ood-sugars all the progeny were normal in this spect. When, however, these seemingly normal ıice were crossed with mice having a high blood-sugar ıe results followed the Mendelian law and the umber of offspring which had high blood-sugar nd those which were apparently normal or hybrid arriers was equal. If the hybrid carriers were ıated with each other the progeny had high blood-ugar in the proportion of one in three. It could be oncluded from these experiments that high blood-ugar was a recessive characteristic, and that the pparently normal hybrid carriers were capable of ransmitting it to their offspring according to Mendelian law. Cammidge in a study of English families found that the same laws were followed. When the disease was transmitted as a dominant characteristic the course was found to be mild; when the characteristic was recessive, the course was usually grave from the onset.

Wright himself describes a series of families in which the hereditary influence of diabetes is very clear. He gives charts of nine families, in three of which both the parents were known to have diabetes. One of the latter group is especially remarkable, for of 30 people belonging to two successive generations 18 were affected with diabetes. In the third generation none of the six children of a diabetic father has developed diabetes but three of them are bleeders. Wright thinks that there are two factors which tend to produce diabetes—namely, a hereditary factor and an acquired factor such as infection or obesity. In any given case either may preponderate, but if both are large the disease seems to be inevitable, whereas if both are small or one is absent it may never appear at all. In this series, as in Cammidge's, when the characteristic was dominant the disease tended to be mild, and there is evidence to show that diabetes innocens (renal or orthoglycæmic glycosuria) is transmitted in a somewhat similar manner. Urban Hjärne[2] has investigated a remarkable family many members of which had glycosuria. He was able to study seven generations, but found no evidence of any abnormality in the first three. In the fourth, which comprised 18 persons, only one had glycosuria, and this did not run the course of true diabetes mellitus. In the third generation there had been a marriage between first cousins, and in the fourth generation one of the children of this marriage had again married a cousin. The members of the next three generations therefore could be divided into three groups according to whether they sprang from two, one, or no first-cousin marriages. Of the first group of 41 persons, 30 were examined and 16 were found to have renal glycosuria as shown by sugar-tolerance tests. In the group springing from one first-cousin marriage, 77 out of 108 were examined and 14 had either a renal glycosuria or a glycosuria without any symptoms, and two had true diabetes mellitus. In the group in which there had been no intermarriage, 72 out of 102 were examined, and ten of these had renal glycosuria and two had true diabetes. It will be remembered also that Parkes Weber[3] has lately described a family in which the mother had had glycosuria without symptoms for 44 years. Of her five children, four had glycosuria without hyperglycæmia, while the fifth, who had a different father, was normal.

Now that insulin has completely altered the outlook for younger diabetics, the ætiological importance of heredity ceases to be of merely academic interest. Requests for advice from diabetics as to whether they may marry become more frequent every year. The best advice can only be given from a clearer knowledge of the importance of the hereditary factor.

THE LEAGUE OF NATIONS AND THE OPIUM TRAFFIC.

THE Council of the League of Nations, now in session at Geneva, will have before it for consideration some of the recent developments directed to the better control of international traffic in narcotic drugs. The convention drawn up in July, 1931, dealing with limitation of the manufacture and distribution of morphine and cocaine and their derivatives, though signed by more than 40 governments, cannot be effectuated until ratified or acceded to by 25 states, members of the League or non-members. Since great importance is attached to the provisions of this convention, and the new machinery which it invokes with a view to checking the appalling amount of illicit traffic in narcotic drugs which has been reported to the League, it is presumed that pressure will be brought to bear upon the signatory Powers to proceed to early ratification. It will be remembered that the assembly of the League last autumn regarded the new convention as but the first step towards the limitation of the production of the raw materials of these pharmaceutical preparations. The original opium convention signed at The Hague in 1912 sought also to limit and control the production of raw opium, and to bring about the gradual and effective suppression of smoking of "prepared" opium. The Geneva convention of 1925, which purported to "complete and strengthen" the provisions of the earlier treaty, nevertheless postponed the period by which the contemplated suppression of opium smoking should be achieved. A commission of inquiry appointed by the council of the League in 1929 visited the Far East to report upon the measures which had been taken, or should be taken, to fulfil the treaty obligations in regard to opium smoking. It presented most elaborate reports on the above question, three volumes of which have been published.[4] A conference convened by the council of the League was held at Bangkok in November, 1931, to consider the situation in regard to opium smoking as disclosed by the reports of the commission. It was attended by representatives of Great Britain, France, India (Burma), Japan, Netherlands, Portugal.

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[1] Amer. Jour. Med. Sci., 1931, clxxxii., 484.

[2] Acta Med. Scand., 1927, lxvii., 422; see THE LANCET, 1928, i., 1077.

[3] THE LANCET, 1931, ii., 71.

[4] See THE LANCET, 1931, ii., 972.

and hyperglycæmia may be succeeded, as toxæmia increases, by hypoglycæmia. Finally, owing to the failure of insulin-production by the pancreas and of other normal sources of supply, as the result of damage to the tissues generally, the blood-sugar again rises with the production of hyperglycæmia. Various observers have reported that the blood-sugar curve in toxic diphtheria is of diabetic type, and Dr. BENN and his colleagues are able to show that the greater the degree of lag exhibited by the curve the worse the prognosis of the case. They detail two series of cases of toxic diphtheria which although not contemporaneous are of comparable clinical severity. The patients in both series received, it will be observed, large doses of antitoxin, usually by both intramuscular and intravenous routes. The average total unitage in both series is fairly comparable. (As to whether a more moderate unitage in both series might have sufficed we express no opinion.) In Series A besides the large doses of antitoxin the patients received dextrose intravenously and subsequently glucose by mouth, and where the nature of the blood-sugar curve appeared to indicate its necessity, insulin intramuscularly. A consideration of the case-mortality and the paresis rate in the two series shows important differences in favour of the dextrose-insulin series. Whereas in that series the case-mortality of 89 consecutive cases of toxic type was 22·5 per cent., in the control series of 131 similar cases treated with antitoxin alone the case-mortality was 35·9 per cent. It can be shown that this difference in the case-mortality in the two series amounts to three times the probable error and therefore must be regarded as significant. The difference is not due to chance. As a matter of fact, the real difference is slightly greater than the authors show. This is due to variations in the age-distribution of the cases in the two series which are not in this respect strictly comparable as the authors state. In the experimental Series A, 65 per cent. of the patients were under 10 years of age; in the control Series B 57 per cent. only. The case-mortality amongst this age-group was 24 per cent. in the experimental series and 45 per cent. in the control series. The difference in the recovery—with paresis rate in the two series is noteworthy; it is 57·3 per cent. in the experimental series and 44·2 per cent. in the control series. It is a fair inference that more patients in the dextrose-insulin series survived to experience pareses in the later stages of the disease.

The administration of glucose in the toxæmia of diphtheria, as in toxæmia due to other infections, is not new. Glucose is now given orally to cases of diphtheria in many fever hospitals, and its use as an adjunct to antitoxin should become general. F. J. HECTOR [3] first suggested the injection of insulin in diphtheria. Provided, and only provided, that facilities are at hand for repeated estimations of the blood-sugar, its use in the type of case described by Dr. BENN may turn the scale. Uncontrolled injections of insulin in diphtheria are dangerous and should never be attempted. There is too great a risk of hypoglycæmia which may be mistaken for a cerebral complication of the disease.

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MEMORIAL TO SIR ANDREW BALFOUR

Sir James Crichton-Browne and a score of others whose names are outstanding in scientific endeavour are signatories to a letter appealing for funds to keep green the memory of Sir Andrew Balfour in the London School of Hygiene and Tropical Medicine. The monument itself is to be simple and inexpensive, appropriate to a man whose influence upon his fellows was so largely due to simplicity of character and sterling honesty of purpose. The school itself is his true memorial, for, as the Prince of Wales said when he opened it, it is a sign that post-graduate education in medicine is about to come into its own; and Balfour supervised every detail in the conception of the school and the structure of the building, keeping in view all the while that it was first and all the time a workshop for the well-being of the Empire. The greater part of the funds will be allotted to helping students, preferably from overseas, to pursue courses of study at the school, and the cosmopolitan preference is again agreeable to the memory of one whose first piece of work was to cleanse the Augean stables of the Khalifate and transform them into the modern well-planned city of Khartoum. During the war here and there, first at Salonica and Egypt, then in Mesopotamia, in East Africa and Uganda, Balfour served as president of a medical advisory committee organising sanitary reforms which have lasted on into peaceful times. His earlier journeys took him to the West Indies and South America, his later ones to Mauritius and Bermuda. There is a fitness in associating his memory with the opportunity for students from every part of the Commonwealth to study the principles of healthy living at the Rockefeller house in Gower-street.

DAWSON WILLIAMS MEMORIAL PRIZE.—The Dawson Williams Memorial Fund was established by a voluntary subscription amongst the friends and admirers of the late Editor of the *British Medical Journal* in 1928. The administration of the fund was placed in the hands of a body of trustees composed of the following:—The presidents (for the time being) of the Royal College of Physicians of London, the Royal College of Surgeons of England, the British Medical Association, the Royal Society of Medicine, and the Section for Disease in Children of the Royal Society of Medicine; and the Editor of the *British Medical Journal*. The object of the fund is the award of a prize, every two years or at longer intervals at the discretion of the trustees, in recognition of work done in connexion with pædiatrics. The first award was made in 1930 to Dr F. J. Poynton, for his work on behalf of rheumatic children particularly with regard to the establishment of specia "rheumatic centres"; and the trustees have decided t make the second award this year to Sir Robert Jones fo his work in connexion with the pædiatric side of orthopædics. With the consent of the Council of the Britis Medical Association the prize will be presented by th President of the Association on the occasion of his presdential address on Tuesday, July 20th.

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[3] THE LANCET, 1926, ii., 642.

r-car by a boy unfitted to handle it. He wished a method of restricting liberty existed half-way veen probation and imprisonment. Finally, on her matter, he made the pertinent inquiry ther the State, now that it assumed responsibility giving every life a chance, might not have some in the question whether in a given case a life uld ever exist. It was significant that every er speaker advocated some form of restriction liberty; the consensus of opinion was that the ion was suffering, like Lucio's friend in Measure Measure, from "Liberty; too much liberty." erty demands a sense of responsibility, and only se prepared to take responsibility can claim it.

TUMOURS OF THE BILE-DUCTS.

During the 20 years 1910–29 53 tumours of the e-ducts were observed at the Mayo Clinic, all cept four of them being malignant. Dr. James M. rshall has collected and analysed these cases in a ent paper.[1] Benign tumours of the extra-hepatic cts, of which H. D. Rolleston and J. W. McNee und only ten cases on record in 1929, are usually pillomatous, fibromatous, or adenofibromatous. vo of Marshall's cases were adenofibromata, one a pilloma and one a congenital cyst of the cystic duct. he 49 malignant tumours were all examples of imary carcinoma. Operation was performed in 5 cases, and in four the condition was found at topsy. Three-fourths of the patients were over 0 years of age, the youngest being aged 23 years; 1 were males, and 18 females. Gall-stones were resent in the gall-bladder or ducts or both in 21 ases (43 per cent.). The commonest sites of the umours were the lower end of the common bile-duct nd the ampulla of Vater. The usual clinical picture vas that of obstructive jaundice, which was present n 44 cases, and varied in degree from slight to extreme. Marked loss of weight was seen in 45 patients and was he most striking manifestation after jaundice. Pain was absent in 15 cases throughout the entire course of the illness, and therefore the presence or absence of pain appears to be of little, if any, diagnostic significance. Pruritus was a prominent symptom in 25 cases, and in several it was the chief complaint. Spontaneous hæmorrhages occurred in 16 cases. Of the 45 patients on whom operation was performed for carcinoma 19 (42·2 per cent.) died within 30 days, 26 survived for an average period of 17·3 months; of these three were still living, respectively, seven months, 20 months, and 34 months after the operation, and in six patients the results were unknown. The high operative mortality is attributed to the tendency to hæmorrhage and technical difficulties of operations on the biliary tract.

THE LIVER AND HÆMOGLOBIN.

It used to be supposed that it was the business of the liver to make bile-pigments out of the remains of red corpuscles. The hæmatoidin crystals in old hæmorrhages showed that the manufacture of bilirubin was not the sole prerogative of the liver, but it has been left to recent experimental research to show that the tissues of the body generally have this capacity. The point which remains in doubt is whether the liver can do it at all; the facts are consistent with the interpretation that its only share in the process is to pick up bile-pigment from the blood and pass it into the bile-ducts. But it has still been generally believed that the liver plays an important part in removing free hæmoglobin from the circulation when, for any reason, red cells have been broken up in the blood, and it is something of a surprise to learn from some recent work by Profs. R. Muir and J. S. Young[1] that this too is in doubt. When a single large dose of dissolved hæmoglobin is injected intravenously, none is excreted in the bile nor do the liver cells show any evidence of hæmoglobin or of an iron-containing pigment. The cells of the convoluted tubules of the kidney, on the other hand, gave a diffuse reaction for iron which, after two or three days, took on a granular form. The spleen was found normal in all respects. When smaller doses were given over a longer period, a marked siderosis of the convoluted tubules of the kidneys was produced. It is known that hæmoglobin free in the blood plasma passes through the glomeruli and it is, no doubt, by reabsorption that it finds its way into the cells of the tubules. This is apparently why a certain amount of hæmoglobinæmia may exist without any hæmoglobinuria. The liver, on the other hand, showed relatively slight or hardly any accumulation of iron, either in the liver cells themselves or in the Kupffer cells. And the authors are disinclined to believe that such increase in the liver as they found really represents any active interest in hæmoglobin. Both spleen and bone-marrow showed more than the normal quantum of hæmosiderin and presumably take their parts in disposing of a hæmoglobinæmia.

ANÆMIA WITH DYSPHAGIA.

The recrudescence of interest in secondary anæmia during the last few years has brought into prominence what has been called the Plummer-Vinson syndrome. In 1922 Vinson associated the peculiar dysphagia, first described eight years previously by Plummer, with a severe secondary anæmia, and we now have records of many cases belonging to this group, a summary being published in 1928 by J. A. Munro Cameron.[2] The main points in the syndrome are that the mucosa of the mouth, pharynx, and œsophagus shows inflammatory changes producing dysphagia, and that the patients exhibit severe anæmia of secondary type. It has been claimed that relief of the dysphagia, which can sometimes be brought about by the mere passage of a tube, will so improve the food intake that the anæmia disappears. Dr. George Graham and Dr. R. S. Johnson[3] now report a series of cases in which they have observed that besides the syndrome as described, there is a definite increase in the fragility of the red blood corpuscles. They call attention to the colour of the skin, which is of a brownish-yellow tint rather than the so-called lemon-yellow of pernicious anæmia. Achlorhydria was present in all their cases, but the histamine test was not performed, and therefore they are unable to say whether the achlorhydria was absolute. On careful test of the fragility of the red corpuscles they found that usually hæmolysis began in concentrations of normal saline higher than 0·50, and was always complete at 0·40. The distinction from acholuric jaundice was confirmed, apart from the dysphagia, by the absence of excess of bilirubin from the blood-serum, whilst the achlorhydria was further evidence. Graham and Johnson are unable to confirm the reported cure of such cases by the simple administration of a full ordinary diet, but found that the anæmia rapidly improved when and Siam, while an observer was sent by the United States of America.

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[1] Surg., Gyn., and Obst., January, 1932.

[1] Jour. Path. and Bact., 1932, xxxv., 113.
[2] Quart. Jour. Med., 1928, xxii., 43.
[3] Ibid., January, 1932, p. 41.

The conference is reported to have adopted a new agreement and final Act dealing with the prohibition of the retail of smoking opium through persons receiving commissions; the definition of minors to whom smoking is forbidden; penalties for inciting minors to smoke; and prohibiting the sale of prepared opium otherwise than for cash. The conference does not appear to have fixed a date from which the 15 years allowed by the Geneva convention for the gradual suppression of opium smoking was to commence. The representative of the United States demurred to the implied double standard whereby governments with Far Eastern possessions sanctioned opium smoking therein while proscribing it absolutely in the home countries. He likewise opposed a government monopoly system which was favoured by other members of the conference, and indeed he contended "that there is but one real method by which to suppress the evil of opium smoking, and that is complete statutory prohibition of the importation, manufacture, sale, possession, or use of prepared opium."

WHAT PROMOTES TUBERCULOSIS MOST?

IT is pretty safe to say that if a score or two of authorities on tuberculosis were asked this question, they would not agree over the answer. In other words, we are still to a certain extent in the dark over the most important question that can be raised in this field. Dr. O. Scheel,[1] chief of a medical service of the Ullevaal communal hospital of Oslo, has lately set out his view that the standard of living is far and away the most important factor in tuberculosis, and that the age at which infection occurs, the intensity of infection, recurrent super-infections, sanatorium treatment, and various other factors play a subsidiary, and perhaps even a negligible rôle. None of the elements of this thesis is new, and at the present time few would deny the importance of the general standard of living in relation to immunity to tuberculosis. The mass experiment in Germany during the late war is in this connexion unanswerable. But Dr. Scheel is greatly daring in this: that he brushes aside as unimportant all the other factors which are supposed to play a part in tuberculosis, and which have determined the expenditure of enormous sums of money during the past half century. Long before the discovery of the tubercle bacillus and the campaign against tuberculosis as an infectious disease was started, the mortality from tuberculosis as well as the general mortality had begun to decline. And while it is thus impossible to correlate the decline in tuberculosis exclusively with the modern campaign against it as an infectious disease, it is possible to establish an intimate association with this decline and the rise in the standard of living for which modern industry is responsible. It has been calculated that during the four centuries before 1880, the stature of the average Norwegian increased by 4 cm. Between 1880 and 1926 it increased by 2·5 to 3 cm., if measurements of recruits during this latter period can be applied to the whole population. Similar increases of stature have been observed in several other countries. Measurements in Norway of young adults belonging to different social classes have shown that the stature of the average man rises with his social status—another proof that stature is determined, to a certain extent, by the standard of living. So far Dr. Scheel is on fairly safe ground H becomes more interesting as he leaves this ground t skate on thin ice by challenging Newsholme's vi in 1906 that the principal cause of the decline tuberculosis is the campaign waged against it as infectious disease. In 1928 there were about 30 infectious cases of tuberculosis in Norway, with onl 5300 beds set aside for them. In other word Norway cannot expect to isolate more than so 18 per cent. of her infectious tuberculous ca Complete isolation of all her infectious cases w in Dr. Scheel's opinion, never be feasible. Parti isolation merely has the effect of deferring the ag of infection in a certain proportion of the populatio nearly all of which, however, is tuberculin posit at the age of 30. Does putting off the evil da from infancy or childhood to adolescence or ear adult life, matter much? As far as girls are co cerned, Dr. Scheel greatly doubts if it is better be infected between the ages of 15 and 20 than school age. He is also sceptical about the importan of the degree of infection, of super-infections, and sanatoriums either as isolation or as therapeu establishments.

THE LIBERTY OF THE SUBJECT.

THE Medico-Legal Society's discussion last w like most other discussions on the Liberty of Subject, covered a very wide field. Dr. L Weatherly gave his views on the regulations u the Defence of the Realm Act, abortion, the position of alcoholics, and the segregation of m defectives. As a veteran psychiatrist, he de a large portion of his address to the working o Mental Treatment Act and criticised the Boa Control for what he described as a "bureau attitude." He also blamed many large m palities for not establishing juvenile cour connexion with their police-courts, and fo administering the Probation of Offenders Act full a measure as it could be administered. accusation drew from Mr. Claud Mullins, the known writer on law reform, an excellent defe magistrates in general. Mr. Mullins, him magistrate, agreed completely with Dr. We on the stupidity of many of the minor regu which had to be enforced in the police-court. I that he wished that legislators, when passing restrictive laws, would sometimes consider the qu not only whether a certain state of affair desirable but whether the laws could be enf and whether the effort to enforce them was while. On the previous day, he said, he had an hour of his public time discussing whet black-currant pastille was properly so-called w contained no currant. His deliberations had complicated by the fact that two learned a had sent him two independent and com different reports on the composition of the p in question. The number of regulations wh was expected to enforce was, he said, amazin they all meant a certain amount of interferenc liberty and considerable expense to the On the subject of probation he uttered a needed reminder that the probation of offende capable of serious misuse. It had, he said noised abroad that the effect of the Act was t every dog to have one bite—a dangerous do It was constantly reported to him by policem missionaries that young offenders said, "O Beak will bind me over; it's a first offence," when the offence was that of driving away an uni

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[1] Acta Med. Scand., 1931, Fasc. I.-III.

SPECIAL ARTICLES

STUDY OF THE B C G STRAIN OF TUBERCLE BACILLUS.

TH AN ACCOUNT OF TWO IMMUNITY EXPERIMENTS AND A PRELIMINARY REPORT ON THE CULTIVATION OF TUBERCLE BACILLI ON BILE MEDIA.

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(From the Field Laboratories, University of Cambridge.)

The organism known as B C G (Bacillo Calmette-uérin) is stated to be lineally descended from ovine tubercle bacilli isolated by Nocard, in 1901, om the milk of a tuberculous cow. Beginning in e year 1907 the strain was subcultured at intervals f from 14 to 25 days upon potato saturated with ·0 per cent. glycerin ox-bile. During the course of he cultivation on this bile medium the organism, riginally of normal "bovine" virulence, became less and less tuberculigenic" and eventually, fter 230 successive subcultures in 13 years, was ound to have lost the power of producing progressive uberculosis in all the domesticated species of animals nd in the highly susceptible monkey.

My investigations of the strain, which have been made over a period of several years, include virulence tests and immunity experiments on various species of animals. In this paper I am reporting the results of the virulence tests and observations on the cultural characteristics.

Two strains of B C G have been used in the investigation. They were both kindly sent to me by Prof. A. Calmette, one in 1921, the other in 1927. The strains proved identical, but the former has been used almost to the exclusion of the latter for the passage and immunity experiments.

My reason for obtaining the strain in the first instance was for the purpose of ascertaining whether or not it could be identified by serological or other tests with any of the well-defined types of tubercle bacilli. Several strains of tubercle bacilli labelled either human or bovine which I had obtained from other laboratories proved on investigation (1925)[1] to have characteristics appertaining to the avian type of tubercle bacillus, and the pathogenic history of B C G (see Calmette[2]) suggested to me the possibility that this strain also might belong to the avian type. I refer particularly to the statement that the strain had lost virulence for the guinea-pig after only 15 subcultures on bile media while retaining it for the rabbit (and the horse) after four years subculture; non-pathogenicity for the guinea-pig with some virulence for the rabbit are features which distinguish the avian from the mammalian types of tubercle bacilli. Also the effects produced in the guinea-pig (acute tuberculosis after intraperitoneal and non-progressive tuberculosis after subcutaneous inoculation) and in the calf (typho-bacillosis without follicular lesions) by the early bile subcultures resembled more those of the avian bacillus than of mammalian bacilli. I may say at once that neither of the two strains exhibit now any of the characteristics of the standard avian tubercle bacillus.

The 1921 strain was subcultured by me on glycerin bile potato for about 18 months (16 transferences), and has since been maintained on plain egg or glycerin egg without bile.

Cultural Characteristics.

The organism has been recovered in culture from many of the several different species of animals inoculated with it. In primary culture on egg and glycerin egg the colonies become visible to the naked eye in the third week and under magnification are seen to be rounded, shiny, and somewhat translucent. On egg the colonies when numerous remain small and fairly uniform; a developed colony has a dome-shaped moist ivory white waxy centre with smooth or granular surface and a thin almost transparent broad crenated margin; on glycerin egg the colonies grow larger than on egg and when numerous coalesce to form a thick, opaque, white, irregular warty layer. When sparsely scattered the colonies grow large and may vary very much in appearance. Three chief forms of large colony have been distinguished:

1. *Flat spreading grey or greyish-white colonies with a* granular surface and a heaped-up warty centre; sometimes there is a coarse warty centre with a narrow margin; the width of the flat marginal part apparently depends upon the degree *of moisture of the medium.*
2. Colonies with a hollow or depressed centre; small varieties resemble a bead, medium-sized varieties are umbilicated, radially divided into segments and resemble a rosette; still *larger varieties are crateriform, often very irregular and* heaped-up, becoming with age studded with small pearly secondary colonies.
3. Convoluted heaped-up colonies with a broad sloping *greyish-white granular margin; the central part may* be conical with smooth radial folds deeply indented or elaborately coiled, and often takes on a reddish colour. This is the "R" form of Petroff[3] and is seen most commonly on glycerin egg. Subcultures of these colonial variants showed no distinguishing features and in virulence tests behaved like the parent strain.

On egg subcultures showed white crumbly masses. On glycerin egg growth was more luxuriant, slightly creamy, nodular, sometimes wrinkled. On bovine serum growth was good but not pigmented. On glycerin agar cultures were luxuriant, creamy, and composed of nodules resembling worm-casts. On glycerin potato the strain also grew luxuriantly, producing creamy warty or wrinkled layers; blue litmus potato was sometimes turned pink. On an asparagin medium and on glycerin broth the bacillus formed a thick whitish pellicle.

The serological reactions of the strain are those of mammalian tubercle bacilli. The bacilli are acid-fast and Gram-fast. Old cultures show vacuolated and palely stained longish forms with dark granules, but no definite branched forms have been seen.

Experiments on Guinea-pigs.

VIRULENCE TESTS.

The virulence of B C G has been tested on 88 guinea-pigs, 26 by intraperitoneal and 62 by subcutaneous inoculation, the tests covering a period of seven years. The majority of the guinea-pigs were "virulence controls," that is to say, animals which were inoculated with the strain from time to time to prove its non-virulence.

Intraperitoneal inoculations.—The doses of B C G ranged from 1·0 to 200·0 mg. Of the 26 guinea-pigs inoculated intraperitoneally two, the dose in each instance being 10·0 mg., died acutely in seven and nine days respectively, and showed at autopsy in each instance thickening and retraction of the omentum (which was composed of translucent grey tissue containing purulent foci), thickening and contraction of the mesentery, milky opacity of the parietal peritoneum, an enlarged soft red spleen, yellow necrotic foci in small number in the substance of the liver (both organs showing grey tuberculous foci on the surfaces), and necrosis of the sternal glands;

both liver and iron were given. This observation, while perhaps adding to the complexities attending the investigation of anæmic cases, is of importance at a time when much light is being thrown upon the various maladies associated with nutrition.

THE CAUSATION OF PITYRIASIS ROSEA.

THE chief importance of pityriasis rosea, which is nearly always a mild and non-disabling eruption, lies in its differentiation from secondary syphilis, with which it is still occasionally confused. The careful experimental work of Dr. M. Sydney Thomson and Dr. J. N. Cumings[1] nevertheless deserves more than a casual reference. Of 18 cases studied since December, 1930, the famous "herald patch" was absent in only three, and only six of them showed any constitutional disturbance, manifest by a temperature up to 100° F. One patient complained of sore-throat, five showed faucial congestion, and three had glandular enlargement confined to the neck in two. Pruritus is by no means a constant feature, and only five made any complaint of it. The youngest patient was a girl aged 21 months, the oldest a woman of 77. Tuberculosis has been claimed as a possible cause by Le Damany, but his evidence is slight, and the Mantoux test in Thomson and Cumings's series was decidedly against such a hypothesis. No one believes that syphilis is a cause, and no investigator has yet demonstrated a fungus which satisfies the usual requirements of staining and culture. According to Benedek, of Leipzig, who has been working on the occurrence and pathogenicity of the *Schizosaccharomyces hominis*, and who took the trouble to present his view and his specimens before the Association of British Dermatologists at Bristol last year, pityriasis versicolor follows supersensitisation of the skin with this organism. But his assumptions have not been confirmed by other workers, and in a series of 24 experiments according to his technique Thomson and Cumings record negative results. Blood counts appear to have revealed "a definite tendency to leucopenia with relative lymphocytosis." This appearance is accentuated in the comparative tables of counts in this disease and 20 consecutive cases of other skin diseases. The type of blood picture resembles that met with in vaccinia, alone among the acute specific fevers, and "may therefore have some significance," they think, in the ætiology. Tests along the lines devised by Dick for scarlet fever—the material being obtained from the scales of a herald patch and added to 10 c.cm. normal saline—gave a positive reaction in 11 out of 13 healthy persons who had never had the disease, in four out of five cases of other skin disease, and only in one case definitely out of ten just recovering from the typical eruption. These results seem to indicate that the cause of the disease is a living virus; yet attempts to inoculate the disease into other subjects all failed. (Wile succeeded four times after many attempts.) After some discussion based on their results Thomson and Cumings come to the conclusion that these point to a virus as the cause of the disease, and agree with Lassar's original hypothesis that it is probably conveyed by the vest or underclothing in immediate contact with the skin. All the suspected garments were of wool or silk and wool, except in one case where the herald patch appeared on the side of the neck soon after wearing a new fur. Two new points which emerge from the investigation will both require confirmation before they can be accepted by the dermatological world. They are the more or less constant leucopenia, with relative lymphocytosis, in convalescent cases, and the similar frequency of negative reactions to intradermal injections of saline extracts of pityriasis rosea scales in patients recently recovering from the eruption.

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[1] Brit. Jour. Derm. and Syph., 1931, xliii., 617.

FUEL AND SMOKE.

ON Monday afternoon Sir Hugo Hirst, President of the Institute of Fuel, handed the Melchett medal for 1931 to Prof. W. A. Bone, of the department of chemical technology of the Imperial College of Science, for the most outstanding work in connexion with fuel. The first award of the medal was made last year to Dr. K. Rummel of Dusseldorf. Prof. Bone has given his life to the study of economy in the consumption of fuel and in the lecture which he delivered after receiving the medal he noted as one of the triumphs of mechanical science that iron could now be produced in a blast furnace at about one fifth the cost in fuel of a century ago. What this economy means to the composition of the air we breathe may be realised by considering that each of us consumes, as he put it, about 500 pounds per annum of iron and steel. The direct fuel saving on the whole world's present output of iron cannot be less than 100 million tons of coke per annum. Yet there is still in all conscience enough solid matter suspended in the air. The Seventeenth Report on Atmospheric Pollution[1] puts it at 550 tons per square mile deposited or brought down by rain each year at one point in Lancashire, and an average of 200–300 for the whole country. The report offers little hope of further improvement in London for many years to come. Indeed, there has lately been a threefold increase in sulphur deposited in such widely separated parts as Ravenscourt Park and Finsbury Circus, and sufficient smoke is still emitted in London during two or three hours of a winter's morning to produce the blackest fog of which we have any experience. Were the emission reduced by one-third we are promised nothing more than delay in the formation of the same fog. Charing Cross is held to be one of the smokiest spots in London and we may take a wry satisfaction in the assurance that the smoke haz in London is far worse than in many industrial centres. The atmosphere at Coventry is singled out as unusuall pure for a city of its size. The fog blanket moreover is not borne entirely by those who make it. Th polluted atmosphere of a town two miles in diamete is clearly to be discerned at a distance of five or si miles down wind; that of one of our monster industri areas of 24 miles in diameter would be perceptib at a distance of 60 to 70 miles, say from London Eastbourne. But in spite of all this the law relati to smoke abatement is pretty much a dead lett in many areas. There is only one district which h a statutory regional authority, and the proposal to set up a joint board in South-East Lancashire has been postponed owing to present financial difficulties. The National Smoke Abatement Society sees our best hope in the formation of advisory committees in areas where no action has at present been taken. Smoke knows no boundaries, the recent report remarks, and the efforts of one authority may be largely nullified by the inaction of adjoining authorities.

DR. William Rees Thomas has been appointed a senior commissioner of the Board of Control.

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[1] Department of Scientific and Industrial Research. Report on Observations for the Year ended March 31st, 1931. H.M. Stationery Office. 5s. 6d.

SORPTION OF B C G FROM THE ALIMENTARY TRACT OF THE GUINEA-PIG.

Twenty-six guinea-pigs were fed with B C G by ette, the doses varying from 30 to 200 mg. urteen of the guinea-pigs were young, weighing m 70 to 110 g.; the remainder ranged in weight m 140 to 700 g. The guinea-pigs were killed er intervals varying from 5 to 84 days, and cultures re sown with emulsions of glands from the neck and e mesentery, and in some instances with spleen lp also.

Sixteen of the guinea-pigs were fed once with C G, the doses ranging from 45 to 150 mg., and ere killed 5 to 84 days later. In 11 of these experi-ents—duration, 5, 7, 8, 8, 14, 15, 28, 28, 31, 56, and 4 days—all the tubes sown remained sterile. In e five remaining experiments, lasting 19, 30, 44, 56, d 84 days respectively, the submental (one case) r the mesenteric glands (four cases) yielded cultures f B C G. In two of the guinea-pigs (19 and 84 ays) the bacilli were numerous in the glands; in he remaining three the number of living organisms resent in the glands was very small; for example, n one of the guinea-pigs (44 days) the whole of the nesenteric glands was used and produced only seven olonies.

Nine guinea-pigs were fed twice or three times with B C G on consecutive days, the total B C G given varying from 30 to 105 mg., and were killed 5 to 31 days after the first dose. Cultures from seven guinea-pigs, many of them young, killed 5 to 11 days after the first dose remained sterile. From two guinea-pigs B C G was recovered in culture; in one instance (six days) only one colony was obtained, while in the other (31 days) 32 colonies were obtained from the submental, and 40 from the mesenteric glands.

The remaining guinea-pig was fed five times during a period of 32 days and was killed 49 days after the first, and 17 days after the last dose. Colonies in moderate number were obtained from the submental glands and none from the mesenteric glands and spleen. In the four instances where spleen was used cultures were negative.

Acid-fast bacilli were very numerous in smear preparations of the fæces passed by guinea-pigs during the first two days following administration of B C G. They were not found on the fourth day in three guinea-pigs but were still present on the sixth, eighth, and eleventh days respectively in three further guinea-pigs.

These observations showed that B C G was abundantly present in the fæces of guinea-pigs during the first two or three days after oral administration, and in one instance was not completely eliminated from the intestinal canal on the eleventh day. Yet very few bacilli appear to have passed through the alimentary mucous membrane as is indicated by the failure in 17 out of 26 cases to cultivate the organism from the glands of the alimentary tract.

Many of the negative results were obtained with guinea-pigs which, though not new-born, were very young, seven weighing 70 to 80 g. (five negative) and eight weighing from 105 to 180 g. (seven negative). These results therefore do not support Calmette in his opinion that the alimentary mucous membrane of young animals has, in general, a greater penetrability for bacteria than that of older animals.

Since my experiments were completed Wethmar and Brunzema [5] (1931) have reported that in their feeding experiments on guinea-pigs with B C G only a very small proportion of the ingested bacilli succeeded in passing from the alimentary canal to the neighbouring glands, and that in this respect there was no difference between new-born and older guinea-pigs.

Experiments on Rabbits.

Inoculation experiments.—Inoculated subcutaneously in a dose of 50·0 mg. B C G gives rise in the rabbit to a local abscess only; the adjoining glands and the internal organs remain free from lesions. The bacilli do not long survive in the local lesion or in the adjacent (scapular) glands to which they are carried by the lymph, as the following cultural experiments show. A rabbit died 37 days after subcutaneous inoculation of 50·0 mg. of B C G and cultures were obtained from the local lesion and scapular glands. A second rabbit was killed 61 days after inoculation; pus from the local lesion sown on several tubes yielded only one colony, while the scapular glands yielded none. A third rabbit was killed 111 days after inoculation; cultures from the scapular gland remained sterile.

After intravenous inoculation B C G sometimes produces very severe effects which may result in death. Twenty-four rabbits were inoculated intravenously with the culture, the doses ranging from 0·25 mg. to 50·0 mg., and of these 12 died in from 7 to 19 days of consolidation of the lungs. In the more acute cases—death within eight days—the lungs were almost completely consolidated and uniformly grey or reddish grey, the condition resembling that which follows intravenous inoculation of dead tubercle bacilli. In rabbits which died in from 12 to 19 days after inoculation the consolidated lung was beset with yellow necrotic foci and there were definite miliary tubercles, many with opaque centres. Other morbid appearances in acutely infected rabbits were enlargement and congestion of the tracheal glands and enlarged soft red spleen; grey follicular tubercles were seen occasionally in the liver. Tubercle bacilli were not numerous in smear preparations from the lung, except after very large doses, and were usually scanty in the other organs. Of the 12 acutely affected rabbits six were young, weighing from 250 to 700 g., and the doses of B C G ranged from 0·25 to 5·0 mg.; six weighed from 1350 to 2070 g. and the doses ranged from 10 to 50 mg.

Ten rabbits were killed 150 to 920 days after inoculation; they were in good health and had gained greatly in weight. Four of these rabbits were from one litter a month old, and each weighed about 200 g. They received doses of from 0·25 to 1·0 mg. and were ill for some weeks. Two were killed 150 days after inoculation and showed no sign of disease. The other two were killed after 920 days; one was normal except for two calcareous foci of doubtful origin in the mesenteric glands; the other showed in the lungs evidence of previous severe inflammation in the form of ramifying superficial fibrous thickenings on the surface and thickening of the interstitial fibrous tissue. Three other rabbits from this litter, inoculated with 0·25, 0·75, and 1·0 mg. B C G respectively at the same time as these four, died within three weeks of pneumonia and miliary tuberculosis of the lungs.

Two adult rabbits received 2·0 and 1·0 mg. of B C G and were killed 590 days later; there was no sign of tuberculosis in either of these rabbits. In the remaining four rabbits, killed 159 to 215 days after inoculation, scattered minute grey tubercles, some opaque and containing acid-fast bacilli, were found in the lungs.

These experiments have shown that the intravenous in one guinea-pig the pleural cavities were filled with fluid and the lungs were collapsed.

The death of these guinea-pigs was due, I think, to the irritant and toxic action of the bacilli which, as shown by cultivation experiments, were disseminated over the body.

One guinea-pig died in ten days as a result of intestinal obstruction from peritoneal adhesions; a sternal gland was slightly caseous; otherwise there were no macroscopic lesions. Another guinea-pig died in 176 days of ascites due apparently to extensive adhesions of stomach and intestines to each other and the parietal wall; there were no tuberculous lesions in the organs or glands. No other guinea-pig inoculated intraperitoneally with B C G died as a result of the injection, the duration of the experiments ranging up to 421 days.

Autopsies on guinea-pigs which had lived some time after intraperitoneal injection of massive doses of B C G showed the omentum converted into a band of fibrous tissue adherent to the stomach, and sometimes to the intestines, and containing one or two collections of creamy pus in which acid-fast bacilli were abundant. There were often small abscesses in other parts of the abdomen—in the splenic omentum, between the coils of the intestines and on the liver or parietal peritoneum—and fibrous adhesions between the viscera and the parietes. In male guinea-pigs the scrotal sacs always contained creamy pus which was locked in by peritoneal adhesions, and in some instances was the cause of atrophy of the testes and epididymes.

Tuberculous lesions have never been seen in the abdominal and thoracic organs and glands of guinea-pigs which have survived an intraperitoneal inoculation of B C G.

Subcutaneous inoculation.—A massive dose—10 to 400 mg.—of B C G in the subcutaneous tissues of the abdominal wall gives rise to a swelling of varying size. At first firm, the swelling soon begins to soften and becomes an abscess. This ulcerates the skin, usually about the tenth day, and discharges its caseopurulent contents. The ulcer rapidly heals and cicatrises, and no trace is visible two to three months later, except perhaps a white scar. The adjacent inguinal glands undergo enlargement which in most instances is slight and transient, generally subsiding completely within four to six weeks; sometimes the enlargement is more definite and persistent, but eventually it always subsides. The glands never become adherent to or ulcerate the skin.

None of the 62 guinea-pigs inoculated subcutaneously died as a result of the injection or showed visceral lesions, although many received the relatively enormous doses of from 50 to 400 mg. Five died after parturition or from intracurrent affections. The remainder having gained in weight were killed in from 14 to 617 days.

Autopsies on guinea-pigs killed within about five weeks of subcutaneous inoculation generally showed at the seat of inoculation a small healing ulcer, or occasionally a subcutaneous collection of caseopus. The inguinal and sometimes the sternal glands were slightly enlarged and perhaps congested and showed possibly one or two foci or areas of necrosis. After six weeks the adjacent glands were normal in size and generally in appearance, but in five out of 51 guinea-pigs they showed a focus or two of pus.

SURVIVAL OF B C G IN THE BODY OF THE GUINEA-PIG.

The viability of B C G after injection into the guinea-pig has been tested by sowing egg and glycerin egg tubes with emulsions of different tissues, or with p from inoculation and glandular abscesses.

The organism has been recovered in culture from the pus of abdominal and scrotal abscesses of the guinea-pigs inoculated intraperitoneally. The duration of life of these animals ranged from 32 to [illegible] days. In two instances—the experiments having lasted 79 and 82 days—the abdominal pus, though containing numerous well-formed bacilli, yielded only one and two colonies of B C G respectively, several tubes having been sown, while in four instances—the duration of the experiments ranging from 70 to 79 days—numerous colonies of B C G were obtained from scrotal pus. No colonies of B C G were obtained from the abdominal or scrotal pus of five guinea-pigs killed 108, 127, 290, 319, and 421 days after inoculation.

After subcutaneous inoculation of cultures most of the bacilli remain at the seat of inoculation where they produce an abscess, but some are carried in the lymph stream to the adjacent glands or are disseminated over the body by the blood. Three to four-weeks after inoculation living B C G in moderate numbers may be demonstrated by culture in the inguinal glands of the guinea-pig, and may also be found, though in much smaller number, in the liver and the spleen. Thereafter there is a rapid fall in the number of viable organisms. The bacillus has been recovered in culture from the spleen of a guinea-pig five weeks after inoculation, but not after longer periods—namely, 6, 8, and 10 weeks.

Cultures of B C G have been obtained from t macroscopically unchanged inguinal glands of sev guinea-pigs which had been inoculated subcutaneou *40, 46, 49, 81, 86, 101, and 103 days* previou In each instance the total number of colonies obtai on the several tubes sown was very small, rang *from two to six.* No colonies of B C G were obtai from the inguinal glands of 24 guinea-pigs killed in from *59 to 92 days* (seven instances) and *111 to 558 days* (17 instances). None of these 31 guinea-pigs showed lesions in the glands or in the organs.

The autopsies on five guinea-pigs inoculated subcutaneously, as previously mentioned, revealed purulent lesions in the inguinal glands. In one of these guinea-pigs, killed 81 days after inoculation, *one purulent focus* was found in an inguinal gland; the whole of the pus was used for cultures and yielded *one colony of B C G only.* In two guinea-pigs, killed 204 and 388 days after inoculation, the pus was sterile. *One guinea-pig,* which was injected in the *deep tissues of the groin* with B C G together with dead human tubercle bacilli and killed 103 days later, showed a small local abscess and no disease elsewhere; the pus yielded half a dozen B C G colonies, *but* emulsions of the inguinal and iliac glands proved sterile.

These cultivation experiments show that the life of B C G in the body of the guinea-pig is comparatively brief. There is possibly some multiplication of bacilli for a period after inoculation, but this evidently soon ceases and the bacilli gradually die. In a few instances numerous colonies were obtained *from* abdominal pus 10 to 11 weeks after *inoculation,* but generally the number of colonies yielded by pus or tissues was small. The longest period elapsing between the inoculation of the guinea-pig and the recovery of the bacillus in culture was *103 days.* Br. Lange [4] was unable to recover the organism in culture from an animal of any species six weeks after inoculation.

astinal gland was a little enlarged. Nothing abnormal here. Moderately numerous B C G colonies from the astinal glands.

oat 122, a nanny, was inoculated intravenously 100·0 mg. B C G and died 63 days later.

ropsy.—The lungs were congested and slightly œdema- ; minute grey tubercles, some with calcareous centres. sparsely distributed throughout the parenchyma. e were *no lesions elsewhere.* A moderate number of G colonies were obtained from lung tubercles and a from a mediastinal gland.

oat 120, a nanny, was inoculated intravenously h 10·0 mg. of B C G. The goat yielded about int of milk daily during the first three weeks after ich the yield rapidly diminished and her health l appetite became poor. She died 82 days after culation.

utopsy.—Lungs patchily hepatised showed grey areas of minous pneumonia and a few grey points but no definite ercles. The mamma contained small quantities of milk, k on left side, normal on right. No T.B. were found in ear preparations and cultures from the milk and various ans and glands did not yield B C G colonies. A guinea- inoculated with milk remained healthy and cultures m its inguinal glands were negative.

SUMMARY:

Eleven goats were inoculated intravenously with C G, the doses ranging from 5 to 100 mg. Nine the goats died—two in 7 and 15 days and seven in om 27 to 101 days—and two were killed 127 and 24 days after inoculation. The two latter and six f the nine fatal cases showed no macroscopic uberculous lesions, and B C G was not recovered om the tissues.

In the remaining three goats there were definite uberculous lesions. In one goat, an adult, the esions (pulmonary) were minute and retrogressive. n the other two, both young animals, the B C G organisms had established themselves and multiplied abundantly—in the intercostal lymphatics of Goat 115, producing small tubercles with necrotic centres, and n the portal gland of Goat 116, causing necrosis without formation of giant cells. The organisms were still, apparently, actively multiplying at the moment of the death of the goats, and one cannot say what would have been the fate of the bacilli if the animals had lived. Presumably, since animals (goats and guinea-pigs) inoculated with the B C G cultures recovered from these goats showed no lesions at all when killed, the organisms would have remained localised and eventually have died out.

It is interesting that 9 out of 11 goats died after inoculation and on necropsy, except in the two adult cases, showed no apparent cause of death. This may, therefore, have been toxæmia from the liberated endotoxins of disintegrated B C G.

Experiments on Fowls.

Seven fowls were inoculated with B C G, three intravenously (doses 10, 50, and 50 mg.), and three intramuscularly (doses 40, 100, and 100 mg.).

The intravenously inoculated fowls were killed 113, 134, and 135 days later respectively, and were found to be free from tuberculous lesions. The intramuscularly inoculated fowls were killed after 112, 162, and 603 days. They showed in the pectoral muscles yellow necrotic substance surrounded by fibrous tissue and containing masses of acid-fast bacilli. In one of the fowls (603 days) the capsule of the liver showed some half-dozen greyish-white flattened tubercles, and a narrow band of fibro-caseous substance around the thin margin, evidently due to bacilli which had leaked from the pectoral muscles into the abdominal cavity; acid-fast bacilli were present but were not numerous.

Cultures from the local lesions and organs of the intramuscularly inoculated, and the organs of the intravenously inoculated fowls remained sterile.

These experiments show that B C G is not virulent for the fowl and soon dies out locally and in the organs.

Experiments on Calves and Monkeys.

The results of inoculation, feeding, and immunity experiments on calves and monkeys have already been published.[6] [7]

The Virulence of B C G after Residence in the Animal Body.

The use of a living attenuated strain of tubercle bacilli as an immunising agent against tuberculosis in man and the bovine animal has been deprecated on the ground that the bacilli might regain their original virulence during residence in the tissues of the new host.

Attenuated bovine viruses may, as I have shown [8] [9] be restored to full virulence by passing the bacilli through the bodies of calves, goats, or rabbits, and the question naturally arose whether B C G, believed to have been originally a virulent bovine strain, might not similarly become enhanced in virulence after a long period of residence and latency in the animal body.

Passage experiments with B C G are peculiarly difficult to perform because the bacilli gradually die out in the animal body and cannot with certainty be recovered in culture if the passage animal is allowed to live longer than three or four months.

As previously stated, B C G has been recovered in culture from a large number of animals of the various species inoculated with it—namely, the calf, rabbit, goat, guinea-pig and monkey. Of the total number of these strains 17 were tested as to their virulence for the guinea-pig, but none produced more than the slight local effects which have followed the injection of the original culture. Single residences, therefore, in the calf (27, 47, and 72 days), rabbit (37 and 61 days), guinea-pig (up to 103 days), goat (48 and 189 days), and monkey (180, 190, and 206 days) caused no increase in the virulence of B C G.

The majority of the guinea-pigs used to test the virulence of B C G recovered from the animals mentioned were allowed to live many months, and for this reason cultures from their tissues were negative. From six guinea-pigs, however, which were killed within 12 weeks B C G was again recovered in culture, and each of these strains was tested on the guinea-pig. Four of the six guinea-pigs, when killed, showed no lesions and did not yield cultures. From the remaining two, cultures were obtained which were passed through other guinea-pigs in series. In one of these experiments after five passages (285 days) the bacilli died out. The other is still in progress. In a few instances B C G was inoculated into a guinea-pig or a rabbit along with killed bovine, human or avian tubercle bacilli. These experiments are not completed, but have not so far produced any increase in the virulence of the organism.

The results of the passage experiments are in agreement with those of Calmette,[10] Kraus,[11] [12] Gerlach,[13] Br. Lange [14] and others, and show that B C G has a high degree of stability in the animal body. While the experiments have not been of sufficiently long duration for one to conclude that the characters of B C G are absolutely fixed, they nevertheless show conclusively that the strain used by me does not contain a virulent element, and is therefore different from those employed by Petroff and Watson.

inoculation of B C G produces in the rabbit a definite tuberculosis. The lesions, however, although more distinct and lasting than in the guinea-pig have, like those in the latter species, no progressive tendency. There is a critical period in the life of a rabbit inoculated intravenously with B C G in which the animal may die; this in my series has varied from 7 to 19 days. Autopsies in these cases have shown that the cause of death is pneumonia, due, I think, to the irritant and toxic action of the bacilli. If the pneumonia is not so extensive as to cause death mechanically the animal recovers; the cellular exudate in the pulmonary alveoli is rapidly absorbed and after five or six months no trace of the infection is left or only slight traces in the form of isolated miliary, encapsuled or calcified tubercles or, as in one rabbit, scar tissue. Whether a rabbit dies or recovers from an intravenous inoculation of B C G appears to depend more upon the susceptibility of the rabbit than on the dose. Rapidly fatal tuberculous pneumonia has been produced in young rabbits by such small doses as 0·25 and 1·0 mg. and in older animals by doses of 4, 10, 20, and 50 mg. while other animals of equal age inoculated at the same time with these doses have survived.

Joint lesions, which occur so frequently in rabbits chronically infected with bovine, human or avian tubercle bacilli, have not been found in any of the rabbits inoculated with B C G.

Feeding experiments.—Seven young rabbits were fed with B C G. One rabbit, 17 days old, received by pipette 100 mg. of B C G as a single dose and was killed 14 days later. The glands of the neck and mesentery were emulsified and used to sow cultures. Two colonies of B C G were obtained from the submental glands; none from the submaxillary and mesenteric glands. (At the same time a member of the same litter was fed with 60·0 mg. of avian bacilli and was killed 14 days later. Cultures from its submental, submaxillary, and mesenteric glands yielded numerous colonies of avian bacilli).

Four rabbits, members of one litter, 9 days old, were fed repeatedly with B C G. One received 195 mg. in six doses during 25 days and was killed 36 days after the first dose. Cultures from the submental glands yielded six colonies of B C G, from the mesenteric none. The remaining three, which received from 225 to 245 mg. in seven doses, were killed 774, 799, and 800 days after the first dose. In one there was no sign of tuberculosis, while two showed one minute opaque focus and a few minute calcareous foci respectively in the mesenteric glands.

One rabbit, 36 days old, received 462 mg. of B C G in nine doses during 29 days and was killed 37 days after the experiment began. Twenty colonies of B C G grew on one egg tube (all others contaminated) sown with an emulsion of neck glands, and none on tubes sown with mesenteric glands.

The remaining rabbit, 15 days old, received 355 mg. in three doses at intervals of a few days and was killed 56 days after the experiment began. All the tubes sown from the glands of the neck, mesenteric glands and spleen remained sterile.

In these experiments on rabbits an extremely small proportion of the ingested B C G was absorbed from the alimentary canal. As stated above B C G was cultivated only from the submental glands of the rabbits. This circumstance is attributable to the method of feeding by pipetting the emulsion between the lips without opening the jaws, resulting in a temporary lodgment of many of the bacilli in the cheek pouches and the teeth sockets. In one rabbit bacilli were numerous in a fæcal pellet passed 48 hours after feeding. The failure to find the bacilli in the mesenteric glands indicated, therefore, that the absorption, if any, from the intestinal canal was very scanty.

The experiments of long duration show that B C G when they reach the mesenteric glands of rabbits may produce trivial local lesions which, however, have no progressive tendency and eventually heal.

Experiments on Goats.

On July 27th, 1926, a kid was inoculated intravenously with 50·0 mg. B C G. It died 15 days later of intestinal coccidiosis. The lungs were crepitant and perhaps a little congested, but were not otherwise abnormal; other organs (except the intestines) and the lymphatic glands were normal.

On Dec. 21st, 1926, four young goats, about 6 months old, were inoculated intravenously each with 50·0 mg. B C G.

Goat 113 died seven days after inoculation of hepatisation of the lungs.

Goat 114 was killed 127 days after inoculation. The autopsy showed no sign of tuberculosis. No T.B. were found in smear preparations.

Goat 115 was killed moribund 143 days after inoculation.

Autopsy.—The lungs showed scattered yellow gritty tubercles, 0·5 mm. in diameter and some minute grey points. Two thoracic glands each contained a minute yellow focus (T.B.). The portal glands showed two gritty foci. Kidneys, a few doubtful grey points. The intercostal lymphatic vessels along the posterior margins of some of the rib showed greyish-yellow tubercles 0·5 to 1·0 mm. in diameter in places they formed chaplets about 2 cm. in length; i other places they were sparsely distributed, some lymphatic showing only one or two. Microscopically these tubercl showed a thick fibrous wall and a necrotic central part i which tubercle bacilli were extremely numerous, occurri chiefly in dense masses. Cultures from these tubercl yielded abundant colonies of B C G; a few colonies B C G were obtained from the mediastinal and mesente glands. A guinea-pig inoculated subcutaneously with 50 m of the intercostal strain died in 48 days, but showed no si of tuberculosis.

Goat 116 died 76 days after inoculation.

Autopsy.—Lungs showed about a third of each cau lobe red and hepatised and elsewhere isolated red and airl lobules; the parenchyma seemed firm and the interlob septa were distinct. The thoracic glands were not obvio enlarged but they were firmer than normal; there were tubercles. Spleen and liver normal. Portal glands seen slightly enlarged and firmer than normal and showed un the capsule a mosaic of greyish-yellow foci or follicles ab 1 mm. in diameter. Kidneys showed a few grey foci doubtful nature. No T.B. were found in lung mediastinal gland; they were numerous in portal gland.

Cultures: A few colonies were obtained from the l and bronchial gland and moderately numerous colonies f the spleen and portal glands. Two guinea-pigs inocul subcutaneously with emulsion of portal glands were fo to be perfectly healthy when killed 218 days later, cultures from the inguinal glands of one remained steril

A guinea-pig inoculated subcutaneously with 25·0 m culture of the portal gland strain was killed 189 days and found to be free from disease; cultures from the ingu glands remained sterile. The culture from the portal g was also tested on two goats by intravenous inoculatio 10·0 mg. The goats died 96 and 101 days later but nothi a tuberculous nature was found in either and microsco examinations and cultures from various organs and gl were negative.

Goat 119, a kid 2½ months old, received 5·0 B C G intravenously.

The animal was killed 324 days later and showe signs of tuberculosis; cultures from an interbronchial g remained sterile.

Goat 121, a nanny, was inoculated intraveno with 100·0 mg. B C G and died 27 days later.

Autopsy showed the lungs expanded and a little cong and œdematous; there were no tubercles. The will be recalled that the Coroners (Amendment))f 1926 abolished franchise coronerships from the of the next vacancy and made fresh provision the rearrangement of districts. Two county ners in London happened to hold franchise ·icts—namely, the districts of the Duchy of caster (Clapham and the Savoy) and Westminster. y resigned their franchise coronerships in order ·eate a vacancy, and the retirements of Mr. Oswald Sir Walter Schröder were made the occasion of a eral review of coroners' districts by the London nty Council. Following the procedure prescribed Section 12 of the 1926 Act, the London County ncil submitted a draft order for a redistribution the coroners' districts of the county. Their eme, which was confirmed in November, 1930, hout substantial variation, reduced the number listricts from seven to six and promised an economy ibout £200 a year. The district which disappeared s the north-eastern division. Where formerly ere were separate eastern, north-eastern, and south-stern districts, there are now an eastern and a ith-eastern district; the latter includes the tropolitan boroughs of Bermondsey, Deptford, eenwich, Lewisham, and Woolwich. The scheme t outstanding, pending the occurrence of vacancies, e franchise coronerships of the Liberty of the wer (part of Stepney in the eastern district) and Southwark (partly within the metropolitan boroughs Lambeth and of Southwark in the southern district d partly in Bermondsey in the south-eastern strict). The intention was that these excluded land areas should be merged in their surroundings ·hen the next vacancy brought the franchise to an nd.

THE SPAHLINGER METHOD FOR THE PREPARATION OF SPECIFIC ANTIGENS.

THE following statement has been supplied by Mr. Henry Spahlinger in order that the method described may be explored in other fields of research.

Principles on which the Method is Based.

The object is to prepare in vitro antigens identical to those generated by a given pathogenic micro-organism in the living body of human beings or of a given animal species in which this micro-organism gives rise to disease. These specific antigens will stimulate the production of antibodies and anti-micro-organism defences identical with those which are elaborated in the living body when it is successfully overcoming disease.

In order to prepare such antigens, the appropriate pathogenic micro-organisms are isolated from an infected subject, without being passed through another animal species, because this might alter their specificity by adaptation to a different zoological species. These micro-organisms are thereafter cultivated under conditions as similar as possible to those present in vivo. This is done on *specific* culture media, which will supply *specific* biochemical material, identical with that provided in vivo, thus enabling these micro-organisms to retain and reproduce in vitro specific protoplasm, metabolism, secretions, aggressive and defensive means, and a specific progeny.

The standard of specificity is set up by the antigenic structure elaborated by a given micro-organism when developing under normal spontaneous conditions in a human or animal body wherein this micro-organism causes the disease which the antigen is directly (active immunity) or indirectly (passive immunity) intended to prevent or cure.

In addition, no chemical or physical reaction or manipulation may be employed, either during or after the preparation of the antigens, which might alter or denature, even to a slight extent, the antigenic specificity.

Method of Preparation of Antigens for the Preventive Immunisation of Cattle against Tuberculosis.

A piece of tuberculous material is excised in a sterile manner from a lesion of one of the dead bovine cattle at a slaughter-house. Tuberculous micro-organisms taken from this material are then inoculated, under sterile conditions, on *specific* media which will supply the micro-organisms with specific *bovine* biochemical material.

The specific culture medium is prepared as follows:

A bovine body fluid (defibrinated blood, serum, organ or tissue extract, &c.) is distributed in test-tubes, made of Jena glass. These test-tubes are thereafter placed, in a sloping position, in an incubator, and the liquid is coagulated at about 65° C. When the tubes and their contents have become cold, there is spread on the coagulated surface of this solid medium a small quantity of normal (non-heated) bovine body fluid (defibrinated blood, serum, organ or tissue extract, &c.); the tubes are then placed in the same inclined position as they were in the incubator, so that the normal bovine fluid well covers the whole surface of the coagulated medium. The tubes are left 18 hours in this position, so that the normal bovine fluid can well impregnate the superficial layers of the coagulated medium.

These specific media, inoculated with native bovine tubercle micro-organisms—i.e., unaltered by passages on artificial media or by passages through an animal species zoologically heterogeneous to bovine cattle—are placed in an incubator where they are kept in the dark at a temperature of 38·5° to 39° C.

As soon as the culture has sufficiently grown, it is reinoculated on specific normal (unheated) bovine media, preferably liquid, consisting of normal defibrinated blood, serum, organ or tissue extract, &c., of bovine cattle, contained in Jena glass flasks. These cultures are then placed in a dark incubator and kept at a temperature of 38·5° to 39° C. When the cultures have sufficiently developed, the tubercle micro-organisms are collected and made into an emulsion in a sterile manner, in the absence of oxygen, with distilled water or normal saline solution.

The emulsion is thereafter distributed into ampoules, put away, and kept in a cool, completely dark place until all the tubercle micro-organisms in the emulsion have died a *natural death* by the efflux of time. According to the nature of the emulsion (its concentration, state of division of the tubercle micro-organisms, &c.), it is necessary to keep the vaccine a considerable time—a year or even longer—before it can be used. It is then a harmless—though effective—material for preventive immunisation.

The antigens thus prepared in vitro are identical with those elaborated by the tuberculous micro-organisms in vivo in diseased bovine cattle, save that the former antigens, when ready for use, will *not* be part of a *living* micro-organism.

Each batch of vaccine must be tested so as to be quite certain that the micro-organisms are indeed dead. Traces of antiseptics, formaldehyde for instance, may be added to the emulsion before sealing it in the ampoules, but every precaution must be taken to safeguard the strictest specificity of the antigenic elements. The vaccines thus prepared retain for years their specific antigenic and vaccinating properties.

It is essential that, from the moment of the isolation of the tubercle micro-organisms and during all the subsequent processes, no reaction or manipulation should take place which might alter, even in a slight degree, chemically, physically, or physiologically, the bacterial metabolism and the antigenic structure of the unmodified bovine tubercle micro-organisms.

The vaccine embodies different bovine strains of tuberculosis.

Summary.

B C G grows luxuriantly on ordinary solid media, producing dry coherent crumbly masses, difficult to emulsify. The cultures closely resemble those of the human tubercle bacillus.

The strain can produce tuberculous lesions in guinea-pigs, monkeys, rabbits and goats. These lesions, however, have not a progressive tendency and after a time they heal, or become obsolescent, the bacilli contained within them dying out.

In large doses intravenously (or intratracheally) the strain has caused in rabbits and monkeys death from tuberculous pneumonia, but this was due to the irritant action of the bacilli and was similar to that which follows the intravenous inoculation of large doses of dead bacilli.

The strain has retained its cultural characteristics and has not become increased in virulence after continuous cultivation on ordinary egg and glycerin egg media for a period of upwards of eight years, or during long residence in the body of an animal, or after passage through a series of animals.

The results of my investigations support the contention of Calmette that B C G may be used as a vaccine without risk of causing progressive lesions.

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(*To be concluded.*)

MEDICINE AND THE LAW.

Unqualified Practitioners and the Title of "Doctor."

AFTER several days' trial at the Old Bailey last week, Rupert Charles Handley Ensor, 51, was found not guilty on charges which alleged that he falsely represented himself to be a duly registered medical practitioner and thereby obtained sums of money from patients. As prosecuting counsel explained, it is not an offence for an unqualified man to practise, but it is an offence for him to obtain fees from patients by making them believe that he is qualified when in fact he is not. One witness from whom it was alleged that £133 had been obtained stated that he saw Ensor standing on the steps of St. Mary's Hospital and that Ensor told him he was a surgeon on the staff. Counsel for the accused gave the following account of his history. Ensor was the son of a clergyman and was trained for the church. He graduated at Cambridge, became a clerk in Holy Orders and served as a chaplain during the war, also obtaining a commission in the Royal Air Force. Ensor, said his counsel, was not a quack but had had medical training. The accused gave details on this point in his evidence. He had passed his third examination for the M.B. degree in 1926, at Queen's University, Belfast, had experience in various hospitals, and obtained his "public vaccinator" certificate in 19[illegible]. In 1931 he took a course in surgery at St. Mary's Hospital Medical School and University College Hospital Medical School. He had been practising for three years. Almost all his patients suffered from varicose conditions of the legs and ulcers arising from those conditions. He treated about 80 patients a week with a solution which he had discovered.

There was some dispute in the case as to whether the accused *called himself "doctor"* or not. He denied the suggestion but admitted that his patients might have given him that title. The Recorder explained to the jury that the registered medical practitioners had no monopoly either of the healing art or of the title "doctor." There were doctors of science, medicine, divinity, literature, music, and other branches of learning. The true issue was whether Ensor had falsely represented himself to be a duly qualified medical man and, in calling himself "Dr. Ensor," had sailed under false colours. As already stated, the accused was acquitted of all the charges.

Overdose of Allonal.

At an inquest at Birmingham on the death of Mrs. Mary West, of Erdington, a verdict was returned of death from misadventure through an overdose of allonal self-administered. The coroner (Dr. W. H Davison) stated that a chemist had supplied th deceased in a year and thirteen days with 3716 tablet of allonal, approximately ten a day. Medical evidenc was given to the effect that the minimum fatal do would be 50 tablets and that death was caus by broncho-pneumonia supervening on narcot poisoning. The coroner observed that there w ample justification for the view that the chem should have consulted the prescribing doctor. Had done so, he would have found out that the doc named was not in fact on the Medical Register. T jury added a rider censuring the chemist a advocating the stricter regulation of the sale of injurious a drug.

Rearrangement of Coroners' Courts.

The inconvenience which the London Cou Council's rearrangement of coroners' courts in south-eastern district is likely to inflict on the med profession was referred to at this week's mee of the Council, when Mr. H. Berry drew attentio the fact that the Greenwich court, allocated for c arising in the borough of Woolwich, was five n distant from New Eltham and Abbey Wood. asked the chairman of the public control commi whether the local branch of the British Me Association and the Woolwich council had ent strong protests against the proposed arrangem and whether the matter could be further consid Mr. C. J. Allpass (chairman of the public co committee) said no direct representation had received from the medical profession, but the Wool borough council had written expressing disagree and stating that the local branch of the Br Medical Association had made a protest. It was proposed, he said, to alter the present arrangem which had been in operation for some time and w the coroner assured the council had caused no in venience. The question of inquest accommodati London, was, however, still under consideration, Mr. Berry would be afforded an opportunit attending the committee when the matter discussed.

PUBLIC HEALTH SERVICES

UAL REPORTS OF MEDICAL OFFICERS OF HEALTH.

e following are 1930 statistics of six counties f the Island of Guernsey.

une of ict and umated R.-G.) ulation.	Birth-rate.	Death-rates per 1000 of the population.					Death-rates per 1000 births.		
		All causes.	Tuberculosis.	Cancer.	Respiratory diseases with influenza.	Heart disease.	Infant and neonatal mortality.	Young child (1–5 yr.) mortality.	Maternal mortality in childbirth.
vickshire (157,140)	16·6	10·8	0·64	1·43	1·1	1·9	50/–	19	4·5
cester-shire .. (338,467)	14·6	11·8	0·70	1·60	1·1	2·7	50/–	12	3·8
olk .. (321,300)	15·3	11·6	0·73	1·67	1·2	2·4	47/–	17	3·7
. Suffolk (209,950)	16·2	11·1	0·76	1·61	1·2	2·2	44/28	13	2·3
onshire (59,270)	15·7	12·2	0·98	1·16	1·5	2·5	65/–	29	5·4
afries-hire (57,008)	18·4	13·4	0·70	1·66	1·8	2·6	49/25	17	7·6
rnsey .. (40,215)	18·8	12·1	0·89	1·47	1·5	1·9	66/26	32	1·3

egistered stillbirths per 100 live births: Warwickshire 4·2, folk 4·5, East Suffolk 3·4, Breconshire 5·6, Guernsey 4·0.

Warwickshire.

Dr. A. H. Wood says the nine transferred institu-ns are of the mixed type and in no case provided th a separate hospital. Relief to the mental spital at Hatton has been afforded by the transfer 30 mild lunacy cases to Alcester institution. casion has not arisen for consultation with the luntary hospitals. Two applications for help from ral districts towards water-supply schemes and one wards sewerage have been received.

The county nursing association, employing 62 urses, covers five-sixths of the county, and the emaining large rural area on the east is looked fter by the Newnham Association with six nurses. he former body undertook 786 midwifery and 290 aternity cases, and the latter 175 and 58. These urses do not attend infectious cases, except tuber-ulosis. The practising midwives numbered 219 nd summoned medical help in one out of every three of their cases. Dr. Wood enumerates the measures taken in recent years to improve the midwifery service in the county, and deplores the fact that deaths in childbirth are much as they were twenty years ago. He has suggested to his committee paying the fees of the practitioners for antenatal examinations at a cost of about £1400 per annum and paying the fees of the midwives for acting as maternity nurses, in cases where a doctor has been engaged, at a cost of about £1500 per annum. Of the 5940 births in 1930, 3172 were attended by midwives alone and 1127 by midwives acting as maternity nurses, leaving 1311 (or 23 per cent.) who were attended by doctors either alone or with nurses unqualified in midwifery or with handywomen. Surely, says Dr. Wood, the time has come for every lying-in woman to have the advantage of a nurse skilled in midwifery.

The condition of the Tame, thanks to better sewage treatment by the towns of the Black Country, improves slowly, and the account of the Avon is more hopeful still. Six rural district councils have promised grants, amounting to £3356, for the reconditioning of 61 houses under the Housing (R.W.) Act, but only four out of 14 rural districts refer to a shortage for the agricultural population.

Of the 195 beds at the sanatorium, 61 are reserved for advanced cases. Dr. Wood thinks this is a mistake, and that eventually the public assistance institutions will be able to free the sanatorium for its proper work. The orthopædic scheme comprises 12 clinics and beds at five hospitals, but two years ago, in order to lessen expenditure, the hospital beds were limited. As a result, many cases wait months for operative treatment, although beds may be available. On Dec. 31st there was a waiting-list of 23 children at one hospital and 22 at another. There are five V.D. clinics, but they fail to reach the whole of the rural population, and many patients must still be receiving unskilled treatment.

Gloucestershire.

Dr. J. M. Martin shows that in altering the county boundaries 15 parishes (population 4918) have been transferred to Warwickshire and Worcestershire, and ten parishes (population 3859) from Wiltshire and Worcestershire have been added to Gloucester. A provisional scheme for grouping of districts for appointments of medical officers of health and for isolation hospitals has been approved. The health visitors have 193 nurse-children under supervision under the Children Act. The 14 institutions transferred, of the mixed type and built about 1810, have 2500 beds including 750 infirmary beds. Except for Thornbury, with a hospital (46 beds), built 20 years ago, the infirmary beds are not satisfactory. There are four large areas now without a hospital. Three of these might be served by extensions of existing hospitals, but the fourth in the north-east should have a new general hospital, serving all classes of the community. There are 212 practising doctors, of whom 175 treat insured patients and 75 are poor-law medical officers. Dr. Martin suggests that the funds available should be divided among the practitioners willing to do the former poor-law domiciliary work on a capitation basis. Thus the insured father and his family, if in receipt of assistance, would probably have the same doctor.

About one in 30 confinements took place in hospital. Some patients had to be moved long distances, and there is need for more maternity beds in some parts of the county. An antenatal centre was opened at Cinderford in 1929, and a second at Lydney in April, 1930. The mothers made good attendances and the midwives are enthusiastic. It is intended to open a new centre every three months. Midwives attended 56 per cent. of the total births and sent for medical help in the same proportion of their cases.

The medical services scheme continues its growth. Four additional out-stations were opened in 1930. The orthopædic scheme, formerly run from Cheltenham Hospital with one surgeon, is now based on hospitals at Cheltenham, Gloucester, and Bristol, and has the services of three orthopædic surgeons. Venereal disease can now be treated at the out-stations, after

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of the salary suggested by the Department of Local Government and Public Health for a medical appointment in the gift of the local authority. This is, however, what has just happened at Limerick. The Department had fixed the salary of a junior house surgeon at £120 a year in lieu of £200 a year decided on by a committee of the Limerick city board of health. The board of health denounced the proposed amount as "scandalous" in view of the cost of professional education, pointing out that tradesmen working in the same institution received wages of £4 6*s*. 8*d*. a week.

With vaccines prepared by the method described above, bovine animals have been most successfully vaccinated in an extensive series of tests. Calves immunised with the bovine vaccine were subsequently injected with large doses of living bovine tubercle bacilli, which they entirely resisted; while unvaccinated calves, used as controls, rapidly succumbed, their autopsies revealing miliary tuberculosis.

Method of Preparation of Antigens for the Preventive Vaccination of Human Beings against *Tuberculosis.*

The vaccine for human beings for antituberculous purposes comprises three different types of vaccine. (1) A *bovine* vaccine (made from *bovine* tubercle micro-organisms grown on specific *bovine* media) prepared as previously described. (2) A vaccine made from *bovine* tubercle micro-organisms grown on specific *human* media.

Bovine tubercle micro-organisms are isolated from tuberculous lesions of dead cattle and grown on a solid medium in the manner previously described. They are, thereafter, inoculated on specific human media, preferably liquid, for instance, normal (unheated) defibrinated blood, serum, ascitic or pleural fluids, &c., and grown in a dark incubator at a temperature of 37·5°. When the cultures have sufficiently grown, the tubercle micro-organisms are collected and made into an emulsion, in a sterile manner, as said above.

(3) A vaccine made from *human* tubercle micro-organisms grown on specific *human* media.

Tubercle micro-organisms of the human type are isolated directly from tuberculous lesions of human beings, inoculated on human media made with defibrinated blood, serum, ascitic or pleural fluids, &c., prepared in the same way as the specific bovine solid media previously described, and thereafter grown in a dark incubator at 37·5°. If agar is added to ascitic fluid, high temperatures must be avoided. Thereafter a normal (unheated) human body fluid is spread on the surface of the solid medium, so that it can well impregnate the superficial layers thereof.

The human tuberculous micro-organisms should be isolated from a human lesion, without animal (such as guinea-pig) passage, so as to avoid adaptation to an animal species which is "foreign" in the zoological sense to the human species, and cultivated directly on a *specific* human culture medium.

When the culture has sufficiently developed on this medium, the micro-organisms are reinoculated on normal (unheated) specific human media, preferably liquid, &c. As soon as these cultures have attained their full development, the tubercle micro-organisms are collected and emulsified, in a sterile manner, as described above. This emulsion must of course embody the different strains of the human type of tuberculosis.

Distilled water, peptone, glucose, glycerin, and other substances, which do not affect the specific properties of the tuberculous antigens, can be added in small quantities to the culture media.

The human and bovine culture media employed must originate from *tuberculous-free* bodies.

It is advisable that the human body fluids be filtered before being made up into the culture media, and the tubercle micro-organisms, grown on these media, should be washed several times in a normal saline solution before being emulsified. This is in order to remove all traces of the culture medium. In addition, formaldehyde may be added to the vaccine for human beings.

The final human vaccine is a mixture of the three types of vaccines above described. The relative proportions of these three vary according to the nature of the particular type of the tuberculous disease.

Of course, human beings cannot be used as controls, or subjected to deliberate massive experimental infection (such as can be applied to cattle) to demonstrate the value of the human vaccine. Therefore conclusive evidence of the degree and duration of the human immunity can only be based on statistics covering a very large number of cases and collected over a period of years during which those vaccinated have been subjected to careful observation.

Potentialities of the Method.

According to the type of immunisation and the species of micro-organisms from which the antigens are derived, the material used should be:

(*a*) The bacterial bodies (whole endotoxins).

(*b*) An extract of the bacterial bodies (partial endotoxins).

(*c*) The specific liquid on or in which the micro-organisms have grown; this liquid containing the soluble antigenic substances (exotoxins)—products of the bacterial metabolism and of the aggressive and defensive means elaborated by the pathogenic micro-organisms.

(*d*) A mixture of (*a*) and (*c*), or (*b*) and (*c*).

There is experimental evidence indicating that this method can be successfully used against various diseases, in human beings and animals, not only for preventive and therapeutic vaccination, but also for the preparation of antitoxic and antibacterial sera, for test purposes, antigen-antibody reactions, &c.

IRELAND.

(FROM OUR OWN CORRESPONDENT.)

THE REPORT OF THE REGISTRAR-GENERAL OF THE IRISH FREE STATE.

THE report for 1930 of the Registrar-General of the Irish Free State has recently been issued. The estimated population was almost identical with that in the previous year, but less by 26,000 than in 1926, when the last census was taken. The emigration was less by 5238 than in 1929, a decrease probably due rather to diminished prospect of employment in America than to increased opportunities at home. The marriage-rate for the yea was 4·63 per 1000, as compared with 4·61 in 192 and 4·86 in the decade 1920–29. In Northern Irelan the rate was 6·07, in England and Wales 7·9, and i Scotland 6·80. The birth-rate in 1930 was 19·8 per 1000, in 1929 it was 19·78, and in the decad 1920–29 it was 20·39. The slight increase in t birth-rate in 1930 makes very little impression in t general trend of decline shown in recent years. Fro 1911–15 to 1925–29 there has been a fall of 9·7 p cent. The percentage of illegitimate births to to births was 3·19 in 1930, 2·80 in 1925–27, and 2 in 1910–12. The percentage in Northern Irela in 1930 was 5·1, in England and Wales 4·6, and Scotland 7·4. The death-rate in 1930 was 14 per 1000 of the population, a rate than which o two years show a lower record—namely, 14·01 1923 and 14·06 in 1926. The rate for tubercul continues to decline, although it is still high compared with other countries. It was 1·30 1000 in 1930, as compared with 1·32 in 1929, and average of 1·49 in the years 1920–29. The dea from cancer continued to increase, the number 1930 being 3329, an increase of 213 over the previ year. On the other hand, the deaths from dise and accidents of childbirth show a slight diminutio 4·77 per 1000 births as compared with 4·82 in previous decade. The infant mortality was per 1000 births, which was two below the rate 1929, and three below that for the decade 1920– The infant mortality among illegitimate chil is, however, appallingly high—251 per 1000, n than four times that among legitimate.

A "SCANDALOUS" SALARY.

It is unusual to find a local health autho criticising, on the grounds of its iniquity, the am

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ong infectious diseases the event of the year water-borne epidemic of enteric fever at echam. The cases of enteric in the county the last four years numbered 2, 3. 3, and 5. 30 they rose in number to 70. In the early of the year there were three cases. and in the hree weeks of September. 23. 31, and 6 cases removed to hospital. Investigation showed water was the only common factor. and later he pipes leading from the springs to one of the had faulty joints close to a land drain. One of ur farm servants was found to be a carrier. The r has worked in this area for more than three , but the chain of circumstances favourable to a -borne epidemic had evidently not occurred e, and on this occasion the water was probably infective for a few days between August 10th 14th. There were few secondary cases, which is reat contrast with the year 1895. when the ication reached a similar figure at a period when oid was endemic.

ro poor-houses, with 27 beds for the sick. transferred to the council under the Local ernment Act. Dr. Ritchie puts forward an active scheme for improving the hospital service he county. There are at present four small tion hospitals. He suggests that of these, maben should be slightly enlarged and carry all the isolation work. There would then be lable 74 beds in three modern well-constructed dings, which could be easily converted into cottage pitals and used as annexes of the four voluntary ral hospitals. thus providing for convalescence abolishing waiting-lists.

Guernsey.

Dr. H. D. Bishop says that the births during the t thirty years of the century numbered 26.919. l the maternal deaths in childbirth 55, giving a e of 2·04 per 1000 births. The deaths from erculosis in 1930 were 36, of which 35 were due to hisis and one to tuberculous meningitis. The gle death from non-pulmonary tuberculosis is eresting on account of the claimed absence of the vine bacillus. Dr. Bishop complains that lmonary tuberculosis is only sent to the sanatorium an advanced stage; he would like the other spitals in the Islands to make greater provision the isolation of advanced cases. His suggestion at the poor-law board should be renamed the mmittee for public assistance, and cease to restrict s hospital provision to paupers, may be helpful. he "homes for workers" committee has completed s housing scheme, and now lends money at a low te of interest to persons who wish to build small ouses for themselves. The chief housing need now, ys Dr. Bishop. is for cheap flats for the small umber of families who are really undesirable tenants. sum of money is voted every year for the treatment of mental defectives. and occasionally cases fter a very long delay are sent to English institutions. Dr. Bishop recommends that the Channel Islands hould establish a joint institution, with facilities or grading and education. He also advocates the ormation of a cancer care committee to undertake publicity work and render assistance to sufferers.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED JAN. 23RD, 1932.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox. 55 (last week 68); scarlet fever. 1502; diphtheria. 946; enteric fever, 22; pneumonia, 1786; puerperal fever, 46; puerperal pyrexia. 108; cerebro-spinal fever. 57; acute poliomyelitis, 4; acute polio-encephalitis, 1; encephalitis lethargica. 16; continued fever, 1; dysentery. 17; ophthalmia neonatorum. 103. No case of cholera. plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on Jan. 26th–27th was as follows: Small-pox. 124 under treatment. 6 under observation (last week 133 and 2 respectively); scarlet fever, 1180; diphtheria. 1451; enteric fever, 8; measles, 756; whooping-cough. 330; puerperal fever, 16 (plus 11 babies); encephalitis lethargica. 223; poliomyelitis. 3; "other diseases." 277. At St. Margaret's Hospital there were 25 babies (plus 14 mothers) with ophthalmia neonatorum.

Deaths.—In 117 great towns. including London, there was no death from small-pox or enteric fever. 40 (12) from measles. 5 (2) from scarlet fever. 41 (10) from whooping-cough. 34 (13) from diphtheria. 49 (17) from diarrhœa and enteritis under two years. and 392 (115) from influenza. The figures in parentheses are those for London itself.

The deaths from influenza show a slight drop from the figure of the two previous weeks. but the total for the year so far amounts to 1155. against 486 for the corresponding period of 1931. Of the great towns Birmingham stands highest this week with 24 deaths from influenza. followed by Manchester with 21. Bradford with 11. and Willesden with 10. Eleven deaths from measles were reported from Manchester. 4 from Stoke-on-Trent. Liverpool and Birmingham each reported 5 deaths from whooping-cough. Manchester and Newcastle each 3. Small-pox is mentioned as a cause of death in December last in a case assigned to Alfreton U.D., Derby.

The number of stillbirths notified during the week was 287 (corresponding to a rate of 43 per 1000 births), including 47 in London.

DEATH CLASSIFIED TO SMALL-POX.

THE fatal case assigned to Alfreton U.D., Derbyshire, was. Dr. Sydney O. Bingham tells us. of the ordinary mild type. It was that of a female infant, aged 6 months. who had just previously had an attack of chicken-pox. The cause of death was stated in the certificate as (1)(*a*) heart failure. (*b*) septicæmia. (*c*) cellulitis of leg; (2) small-pox. There was no post-mortem examination.

A CORRECTION.—In summarising the annual health report of Belfast in our issue of Jan. 9th (p. 105) we are sorry to have attributed to Dr. P. S. Walker some observations and opinions of Dr. Andrew Trimble. It was Dr. Trimble who pointed out that albumose or albumin is generally present in a positive sputum, and the particulars of pregnancy and tuberculosis were also contained in his report as chief tuberculosis officer.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE.

F. W. A. Fosbery to be Surg. Lt.

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Many of the houses occupied by agricultural labourers and people in similar circumstances are poor in fabric and accommodation and cannot be considered in any way as reasonably fit. The agricultural labourer with 30*s.* a week cannot pay more than 4*s.* in rental. A table is included in the report showing the housing activities of the district councils, from which it appears that certain councils have been able to let houses at a rental of from 2*s.* 6*d.* to 3*s.* per week, inclusive of rates. Dr. Ruddock-West points out that if a large family occupies a condemned house, a special grant for rehousing them is available under Section 26 of the Housing Act, 1930. Some districts have used the Housing (R.W.) Act with satisfaction, while others have neglected it.

East Suffolk.

Dr. B. Wood-White shows that the district nursing associations have increased in number from 36 in 1921 to 70 in 1930. Of 320 parishes, 49 lack the services of a district nurse. From the point of view of public health administration, the provision of a general nursing service in urban and rural areas is of primary importance, and Dr. Wood-White thinks it is the right policy for the council to employ the district nurses as health visitors, in order that district nursing associations may ultimately cover the whole of the county. Some of the district nurses, however, have not had a general hospital training, and their experience and knowledge are not equal to those of a whole-time health visitor. Dr. Wood-White was unfortunately ill for five months during 1930, and his comments on the transferred medical services and institutions are not therefore available. He has much to say, however, as to the transferred Children Act, 1908. During the last quarter of the year the health visitors and district nurses supervised 357 nurse-children. The supervision age should, he thinks, be extended from 7 to 15 years. He regards lump sum payments as on the same footing as insurance policies. The arrangements for getting information from the foster-mother he finds inadequate. He cites a bad case of neglect, which came before a lenient bench. If, however, he had removed all the children to a place of safety, no bench of magistrates could have ordered the children to be taken back until the house was fit for their reception. Everyone will agree with Dr. Wood-White that the foster-mothers and their homes should be registered before any child is received.

In the towns of Eye, Framlingham, Needham Market, and Wickham Market there is no constant and pure water-supply, and in most of the rural districts a constant and pure supply of water is a rarity. Although the rural population drinks water that is polluted to some extent from time to time, Dr. Wood-White has not come across an outbreak of water-borne disease during his eight years' experience.

There is no tuberculosis dispensary in East Suffolk; patients are visited systematically at their own homes by the tuberculosis officers. There is, however, an examination centre at Lowestoft (population 44,000) which is apparently not much used, and Dr. Wood-White gives his reasons for thinking it would be impracticable to set up an examination centre in any other place.

Breconshire.

Dr. Herbert Davies says four poor-law institutions were transferred to the council and that one of them has since been closed, the inmates being moved to one of the others. The beds available are 43 for men, 42 for women, and 19 for children. The mental hospital at Talgarth, with accommodation for 481, is used jointly with the counties of Montgomery and Radnor. Health visiting and school nursing is carried out by four whole-time visitors, and the 19 nurse-midwives of the local nursing associations, which are subsidised according to the work done. There are 79 practising midwives, 71 trained and eight "bona fide." The midwives attended 827 of the 932 live births and 43 stillbirths. They sent for medical help in 204 of their cases. There are 12 maternity and child welfare centres, conducted by the local nursing associations. The centres receive grants and are attended by the assistant medical officer of health, Dr. Winifred E. Probert. No action has as yet been taken with regard to antenatal centres.

Dumfriesshire.

Dr. John Ritchie, referring to the high maternal mortality (which compares with a rate of 7·0 for all Scotland), expresses his conviction that this rate could be reduced if adequate prenatal supervision were possible. It is comparatively easy to provide antenatal clinics in towns, but these have no place in rural administration with a widely scattered population, and the only promising scheme must be based on the local practitioners and district nurses.

Water-supply is the most difficult problem before the county and governs the question of house provision. A number of water schemes have been put forward recently and all given up on account of the cost. Dr. Ritchie suggests that the provision of gravitation water on a large scale must be a matter for earnest consideration. There are several places where reservoirs could be constructed to serve the whole county, but the vast cost of distribution is the obstacle, which the Town and Country Planning Bill may help to remove.

Among infectious diseases the event of the year was a water-borne epidemic of enteric fever at Ecclefecham. The cases of enteric in the county during the last four years numbered 2, 3, 3, and 5. In 1930 they rose in number to 70. In the early part of the year there were three cases, and in the first three weeks of September, 23, 31, and 6 cases were removed to hospital. Investigation showed that water was the only common factor, and later that the pipes leading from the springs to one of the tanks had faulty joints close to a land drain. One of the four farm servants was found to be a carrier. The carrier has worked in this area for more than three years, but the chain of circumstances favourable to a water-borne epidemic had evidently not occurred before, and on this occasion the water was probably only infective for a few days between August 10th and 14th. There were few secondary cases, which is in great contrast with the year 1895, when the notification reached a similar figure at a period when typhoid was endemic.

Two poor-houses, with 27 beds for the sick, were transferred to the council under the Local Government Act. Dr. Ritchie puts forward an attractive scheme for improving the hospital service of the county. There are at present four small isolation hospitals. He suggests that of these, Lochmaben should be slightly enlarged and carry out all the isolation work. There would then be available 74 beds in three modern well-constructed buildings, which could be easily converted into cottage hospitals and used as annexes of the four voluntary general hospitals, thus providing for convalescence and abolishing waiting-lists.

Guernsey.

Dr. H. D. Bishop says that the births during the first thirty years of the century numbered 26,919, and the maternal deaths in childbirth 55, giving a rate of 2·04 per 1000 births. The deaths from tuberculosis in 1930 were 36, of which 35 were due to phthisis and one to tuberculous meningitis. The single death from non-pulmonary tuberculosis is interesting on account of the claimed absence of the bovine bacillus. Dr. Bishop complains that pulmonary tuberculosis is only sent to the sanatorium at an advanced stage; he would like the other hospitals in the Islands to make greater provision for the isolation of advanced cases. His suggestion that the poor-law board should be renamed the committee for public assistance, and cease to restrict its hospital provision to paupers, may be helpful. The "homes for workers" committee has completed its housing scheme, and now lends money at a low rate of interest to persons who wish to build small houses for themselves. The chief housing need now, says Dr. Bishop, is for cheap flats for the small number of families who are really undesirable tenants. A sum of money is voted every year for the treatment of mental defectives, and occasionally cases after a very long delay are sent to English institutions. Dr. Bishop recommends that the Channel Islands should establish a joint institution, with facilities for grading and education. He also advocates the formation of a cancer care committee to undertake publicity work and render assistance to sufferers.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED JAN. 23RD, 1932.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 55 (last week 68); scarlet fever, 1502; diphtheria, 946; enteric fever, 22; pneumonia, 1786; puerperal fever, 46; puerperal pyrexia, 108; cerebro-spinal fever, 57; acute poliomyelitis, 4; acute polio-encephalitis, 1; encephalitis lethargica, 16; continued fever, 1; dysentery, 17; ophthalmia neonatorum, 103. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on Jan. 26th–27th was as follows: Small-pox, 124 under treatment, 6 under observation (last week 133 and 2 respectively); scarlet fever, 1180; diphtheria, 1451; enteric fever, 8; measles, 756; whooping-cough, 330; puerperal fever, 16 (plus 11 babies); encephalitis lethargica, 223; poliomyelitis, 3; "other diseases," 277. At St. Margaret's Hospital there were 25 babies (plus 11 mothers) with ophthalmia neonatorum.

Deaths.—In 117 great towns, including London, there was no death from small-pox or enteric fever, 40 (12) from measles, 5 (2) from scarlet fever, 41 (10) from whooping-cough, 34 (13) from diphtheria, 49 (17) from diarrhœa and enteritis under two years, and 392 (115) from influenza. The figures in parentheses are those for London itself.

The deaths from influenza show a slight drop from the figure of the two previous weeks, but the total for the year so far amounts to 1155, against 486 for the corresponding period of 1931. Of the great towns Birmingham stands highest this week with 24 deaths from influenza, followed by Manchester with 21, Bradford with 11, and Willesden with 10. Eleven deaths from measles were reported from Manchester, 4 from Stoke-on-Trent. Liverpool and Birmingham each reported 5 deaths from whooping-cough, Manchester and Newcastle each 3. Small-pox is mentioned as a cause of death in December last in a case assigned to Alfreton U.D., Derby.

The number of stillbirths notified during the week was 287 (corresponding to a rate of 43 per 1000 births), including 47 in London.

DEATH CLASSIFIED TO SMALL-POX.

THE fatal case assigned to Alfreton U.D., Derbyshire, was, Dr. Sydney O. Bingham tells us, of the ordinary mild type. It was that of a female infant, aged 6 months, who had just previously had an attack of chicken-pox. The cause of death was stated in the certificate as (1)(*a*) heart failure, (*b*) septicæmia, (*c*) cellulitis of leg; (2) small-pox. There was no post-mortem examination.

A CORRECTION.—In summarising the annual health report of Belfast in our issue of Jan. 9th (p. 105) we are sorry to have attributed to Dr. P. S. Walker some observations and opinions of Dr. Andrew Trimble. It was Dr. Trimble who pointed out that albumose or albumin is generally present in a positive sputum, and the particulars of pregnancy and tuberculosis were also contained in his report as chief tuberculosis officer.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE.

F. W. A. Fosbery to be Surg. Lt.

ROYAL NAVAL VOLUNTEER RESERVE.

Proby. Surg. Lt. E. F. St.J. Lyburn to be Surg. Lt.

ROYAL ARMY MEDICAL CORPS.

Majs. W. B. Stevenson and C. J. H. Little retire on retd. pay.

Lts. H. W. Daukes, A. T. H. Marsden, and L. R. H. Keatinge *to be Capts.*

ROYAL AIR FORCE.

Flight Lt. J. W. Harper relinquishes his commission on completion of service and is permitted to retain his rank.

AUXILIARY AIR FORCE.

No. 600 (*City of London*) (*Bomber*) *Squadron.*—H. W. Walter is granted a commission as a Flying Officer.

DEATHS IN THE SERVICES.

Deputy Inspector General Samuel William Vasey, R.N. retd., a St. George's man who qualified in 1877, died at Teignmouth on Jan. 17th, aged 76. He entered the Navy as a surgeon in 1878 and a year later saw active service in the Zulu War, landing with the Naval Brigade of the *Boadicea* (Zulu Medal and Clasp); later he was present at the destruction of Batolonga on the West Coast of Africa; and during the Egyptian War of 1882 was surgeon of the *Seagull* (Egyptian Medal and Khedive's Bronze Star). In 1890 he became staff surgeon, and four years later fleet surgeon. In 1900 he served in the *Centurion*, the flagship of Vice-Admiral Sir Edward Seymour during the China operations, and after being appointed to the *Defiance*, the torpedo school ship at Devonport, retired in 1909.

CORRESPONDENCE

ANDREW BALFOUR MEMORIAL.

To the Editor of THE LANCET.

SIR,—It has been decided to found a memorial to Sir Andrew Balfour, who died in January, 1931, shortly after the opening of the London School of Hygiene and Tropical Medicine, of which he was the first Director. When funds are available it is intended to place a simple and inexpensive monument in the school, and with the remainder of the sum received to establish an Andrew Balfour Memorial Fund for helping students, preferably from overseas, to pursue courses of study at the school. We feel that Balfour's many friends all over the world would not wish to miss the opportunity of contributing to such a memorial, and we are confident that even considerations of hard times, heavy taxation, or other depressing circumstances will not deter those friends from helping to build up a fund of worthy proportions as a permanent memorial to a magnificent career.

While it is hoped that all who can do so will send a donation in the near future, it is not proposed to limit the period during which the fund will remain open, and promises of donations or bequests will be gategully acknowledged. Contributions should be sent to the Honorary Treasurer, Andrew Balfour Memorial Fund, London School of Hygiene and Tropical Medicine, Keppel-street, W.C.1.

We are, Sir, yours faithfully,

JAMES CRICHTON-BROWNE,
JAMES CURRIE,
M. H. G. FELL,
W. H. N. GOSCHEN,
D. LYALL GRANT,
W. W. JAMESON,
P. S. LELEAN,
LLOYD,
MONTAGU NORMAN,
W. ORMSBY-GORE,
A. T. STANTON,
HENRY S. WELLCOME,
C. M. WENYON,
REGINALD WINGATE.

January, 1932.

THE CARDIAC CYCLE.

To the Editor of THE LANCET.

SIR,—Your reviewer states accurately the conclusion I had reached concerning the genesis of the pulse-wave—viz., that it resulted from the impact on the aortic valve of the rising tension developed within the ventricle during the isometric phase of the systole; but he calls this a "hypothesis." I prefer to call it a deduction arrived at by an argument based upon a postulate which he entirely ignores, namely, that the laws which govern the operation of matter in the outside world continue to rule unchanged after the incorporation of such matter within the living organism. Thus I have urged that Newton's laws of motion must hold good in Harvey's circulation.

As the reviewer states the case with this postulate left out, my deduction is in the air and stands as a mere arbitrary statement without authority, since I do not bring any experimental evidence. But is there any experimental evidence on the time relations of the conclusion of the isometric phase and the commencement of the expulsion phase? He says my conclusion (his hypothesis) "is entirely incompatible with the known experimental facts," but he does not cite these "facts." What can I say more? He has left undiscussed the postulate which is stressed in the opening words of my argument; which, so far as I am aware, does bring forward a new method of approach regarding the problem of the circulation.

I share his desire for experimental confirmation of my contentions, but think they may be very difficult, since they will have to deal with such minute time-quantities, 1/100th of a second or less. Besides, experiment is not without its dangers—for how many years did not the development of a negative pressure within the ventricle, during diastole, continue to be taught, because Newton's law of inertia was not made sufficient allowance for until the inertia of the lever was got rid of by using the beam of light?

I am, Sir, yours faithfully,
HARRINGTON SAINSBURY.

Hampstead, N.W., Jan. 28th, 1932.

TREATMENT OF SUBACUTE COMBINED DEGENERATION OF THE CORD.

To the Editor of THE LANCET.

SIR,—I have read with great interest Dr. Sargant's paper in your last issue on the treatment of subacute combined degeneration with massive doses of iron. The striking results obtained certainly merit prolonged further trial. There are, however, two points which call for some remark.

1. The author states that "in the treatment of subacute combined degeneration of the cord, liver therapy is usually of little or no use." The results obtained in a large series of cases investigated in Newcastle,[1] Toronto,[2] Baltimore,[3] and Boston [4] have shown that whole liver, in adequate amounts, is effective in the majority of cases. But the amount of liver required for producing neurological benefit is frequently much more than that required for the maintenance of the red blood-cell level. Indeed, many cases require from 240–480 g. of whole liver daily. In a total of over 150 liver-treated cases of subacute combined degeneration at the Massachusetts General Hospital,[4] Boston City Hospital, and Royal Victoria Infirmary,[1] it was possible to find less than ten who had failed to respond when the dosage had been 240–480 g. for four months or more. The majority had benefited even with doses as low as 960 g. a week. Those who had died or failed to improve, and those in whom neurological symptoms developed for the first time during treatment, had taken liver in small amounts, or irregularly, often in the form of liver extract; in many of these septic complications were present also.

2. The statement that "in cases of subacute combined degeneration, the blood picture is rarely that of a typical pernicious anæmia" has already been criticised in your annotation. Experience has shown that the anæmia which is almost invariably present at some period of the disease is typically "pernicious" in type, both morphologically and in its response to treatment. It is noteworthy that three out of four of Dr. Sargant's cases had a colour-index of 1·0 or over.

With regard to the possible nature of the factor responsible for the neurological improvement (p. 255), it may be noted that it is presumably a substance present in both liver and brain in approximately equal proportions, with perhaps a slightly greater concentration in brain tissue. As already mentioned this would virtually exclude the so-called anti-anæmic factor, and also vitamin A. In my paper further discussion of the nature of the effective substance was not entered into, as I thought this would be better postponed until further evidence is available as to the relative potency of brain, liver, and other substances for producing neurological benefit.

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[1] Ungley, C. C., and Suzman, M. M. Brain, 1929, lii., 271; also Newcastle Med. Jour., 1929, ix., 67.

[2] Farquharson, R. F., and Graham, D.: Canad. Med. Assoc. Jour., 1930, xxiii., 237.

[3] Baker, B. M., Bordley, J., iii., and Longcope, W. T.: Minnesota Med., 1930, xiii., 815.

[4] Suzman, M. M.: Trans. Amer. Neurolog. Assoc., 1931.

The statement attributed to me in the annotation that I concluded "that the effect of brain upon the nervous system is markedly greater than that of liver," requires moderation, and differs in degree from the deductions I actually made in my paper.

I am, Sir, yours faithfully,

Newcastle-on-Tyne, Jan. 30th, 1932. C. C. UNGLEY.

To the Editor of THE LANCET

SIR,—While Dr. Sargant's results in the treatment of four cases of subacute combined degeneration of the cord with large doses of iron are of interest and importance, his summary dismissal of liver treatment as "usually of little or no use" should not I think pass unchallenged. Since the publication in 1929 by Ungley and Suzman of their observations on 61 cases seen at the Royal Victoria Infirmary, Newcastle, during four years, further experience has not led me, personally, to doubt the general truth of their conclusion that whole liver in adequate amount has a markedly beneficial effect on this condition. Much longer time is required to produce amelioration of the nervous symptoms and signs than to render the blood count normal, and relapse rapidly follows cessation of liver feeding. While I have seen remarkable improvement in advanced and bedridden cases, I think it of much greater importance to detect the cases early as there is then a good prospect not only of arrest of the process, but of considerable retrogression of the symptoms and signs.

Insistent subjective symptoms, especially tingling in hands and feet, arising in people at or over middle age, are highly suggestive, though not sufficient for the diagnosis of subacute combined degeneration, even if associated with loss of the deep reflexes; but if to such paræsthesiæ is added definite ataxia, even though slight, the diagnosis appears to me fully justified, always provided early or manifest signs of pernicious anæmia can be detected. Complete achlorhydria is a necessary part of the picture.

Advanced cases, cases complicated by severe sepsis, and I think also some cases which relapse by reason of stopping liver, may show little or no response, and there is no doubt that some cases in whom none of these factors is present fail to respond for no known reason. My experience, however, supports the claim of Ungley and Suzman that the last group is a small one.

I am, Sir, yours faithfully,

Newcastle-on-Tyne, Jan. 30th, 1932. F. J. NATTRASS.

THE SPAHLINGER VACCINES.

To the Editor of THE LANCET.

SIR,—I have the honour to enclose herewith a statement of my method for the preparation of antigens, with detailed reference to tuberculosis. With this *formula*, I have made bovine antituberculous vaccines for a number of years, and a series of tests has been carried out with very successful results. The vaccine is absolutely free from living micro-organisms and has been used for human antituberculous vaccination by distinguished medical men. But only large and extended statistics can provide evidence as to the degree and duration of the immunisation in human beings.

One of the aims of my researches has been to elucidate the mechanism of antibody production. It is my intention to communicate the results of these researches before a scientific body at an early date. I trust that you will accord me your valuable coöperation by publishing my formula for the information of your medical and scientific readers, so that this method can, without delay, be explored in as many other fields of research as possible.

I am, Sir, yours faithfully,

H. SPAHLINGER.

Institut Bactériothérapique, Carouge, Genève,
Jan. 28th, 1932.

⁂ The statement referred to appears on p. 309.—ED. L.

TUBAL PREGNANCY.

To the Editor of THE LANCET.

SIR,—Mr. W. E. Tanner's account, in your issue of Jan. 16th, of an instance of Cullen's "umbilical sign" in a case of intraperitoneal bleeding at once attracted my attention. Ever since it was first described in 1920 or thereabouts, I have been on the look-out for it. In spite of likely opportunities I have not seen the condition nor do I know of any other reported instance. Indeed, doubt has been thrown upon its significance by E. A. Schumann, who records[1] a case in which there was "marked bluish discolouration about the umbilicus." This was thought to corroborate the diagnosis of ectopic pregnancy which had been based on a highly suggestive symptom-complex. However, at operation there was found: (1) normal uterine pregnancy, (2) bilateral acute salpingitis, (3) no blood in the peritoneal cavity. Therefore, he argued, the sign is not pathognomonic.

The possibility of the bruising being due to external manipulations applied to relieve pain has been suggested, but Mr. Tanner tells me that he has assured himself that nothing of the sort occurred in his case.

I am, Sir, yours faithfully,

Sheffield, Jan. 27th, 1932. MILES H. PHILLIPS.

To the Editor of THE LANCET.

SIR,—In my short letter published in your issue of Jan. 23rd, concerning Mr. Tanner's interesting report of a case of tubal pregnancy, in which he said "I cannot find a record of any similar case"—a very different statement from "it was rare" which is what, he now declares, was all he suggested—I pointed out that the sign of umbilical discolouration had been first described "in the United States many years ago." I had Cullen's name in mind, but, being, as I said in that letter, away from references when I wrote, I did not wish to commit myself further in regard to details, and I merely called Mr. Tanner's attention to the fact that the sign was "not unknown." I have seen it myself, and one of my assistants, to whom I have spoken, tells me he has seen it independently. I have, for a long time, referred to it when discussing with my students tubal gestation. However, this matter is no longer in doubt, and now that attention has been focused on it, we shall, perhaps, hear more about it in future.

With regard to the letter—an unhappy essay in respect of manners and material—of Mr. Aubrey Goodwin, whom I do not know personally, I can only say that I have never indulged in "post-prandial red herrings," nor is it a "fact," as Mr. Goodwin states, "that Prof. Blair Bell likes to feel that he is not as other gynæcologists"; the truth is rather that he wishes some other gynæcologists felt as he does about conservative gynæcological surgery. Clearly Mr. Goodwin has not read my address[1] on this subject. I daresay he would consider it waste of his valuable time to do so. Nevertheless, I can assure him that outside London, at any rate, there are gynæcologists in this country, as in America, who approach the treatment of tubal pregnancy with the same physiological reverence that I do. This is not to say that every tube can be saved: such a statement would be ridiculous; but it may safely be asserted that in at least 80 per cent. of all tubal pregnancies the tubes can be and should be conserved. It seemed to me that Mr. Tanner's case was one suitable for conservative measures, so I asked why a drastic—that is, eradicative—procedure had been practised.

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[1] Amer. Jour. Obst. Gyn., 1923, vi., 632.

A considerable number of cases successfully treated on conservative lines could be collected in this country alone—patients who, as my own, have had children afterwards. In none of my patients so far as I know has ectopic pregnancy subsequently occurred. This question was raised when I first reported a case in 1922.[2] Recent inquiries have brought the information that this patient, hitherto nulliparous, has since had two healthy children.

Further, I may say that tubes treated conservatively by us are now subsequently tested by means of lipiodol injections. All my cases so examined, even those in which the condition has been of long standing, have shown patency with the possible exception of one. Further facts may be obtained from my address to which reference has been made.

I am sorry that any gynæcologist should find it necessary to ask me such elementary questions as those propounded by Mr. Goodwin. However, I suppose I must answer them or he will accuse me of evasion which is not one of my bad characteritics.

1. *Tubal pregnancy occurs more often in normal tubes than in abnormal.* So long ago as twenty-two years I wrote: "Formerly, it was supposed that inflammatory diseases of the tubes were the cause of tubal pregnancies, but it is now thought that the condition is more or less accidental and depends upon the situation of the ovum at the stage of development when the trophoblast is capable of producing implantation."[3] I have never had any reason to alter that view, indeed it has been confirmed. There is, of course, no doubt that anatomical anomalies produced by errors of development, neoplasms and infections may occasionally be the ætiological factors concerned, but they are, I believe, relatively uncommon. I cannot here discuss all the evidence that supports the view I have quoted—indeed, to do so can hardly be necessary to-day.

Conclusion.—It *is* sound surgery to conserve the tube, when there is no definite contra-indication to this procedure. It is unsound surgery—antiquated surgery—to do otherwise.

2. The guarantee for which Mr. Goodwin asks in his second question is given in our knowledge of physiological and pathological processes—namely, that as a rule the chorionic elements perish soon after the death of the embryo, and that chorion-epithelioma is as rare in the Fallopian tubes as it is in the uterus, and for the same reason.

3. No guarantee is required that the "large vessels ruptured in the tube wall, or even the raw edges will not continue to bleed . . ." for three reasons: first, bleeding has often ceased entirely; secondly, if it has not it can generally be controlled by simple surgical procedures; thirdly, in a few cases, as I have said, removal may be necessary—the number depending on the craftsmanship and vision of the surgeon.

In amplification of this last answer, I would point out that ampullary pregnancy is the commonest type of tubal gestation, and that a majority of these have aborted completely at the time of operation or have been converted into moles with no evidence of active hæmorrhage. I have removed quite large moles by salpingotomy, and one or two through the dilated abdominal ostium.

Mr. Tanner says nothing about active bleeding. Out of fairness to him I said "presumably" the tube contained a mole; but, frankly, the illustration is much more like that of the ampullary end of a tube from which complete abortion had occurred, and which required no more than suspension to the round ligament; but obviously I cannot speak definitely about this not having seen the specimen. Still there is nothing in the text to indicate anything to the contrary, and the simple procedure just mentioned would have saved the time which Mr. Tanner appears from his letter to have required for some reason not explained. He writes that removal was "the only quick and safe way of arresting hæmorrhage which had filled the abdomen with blood." However, if there were a mole still in the tube, salpingotomy or its removal through the abdominal ostium would have taken very little time. I have never seen the abdomen "full" of blood in this type of case, if in any. In this patient the history indicates that tubal abortion commenced on Oct. 17th and that there was pain and vomiting on Oct. 30th; but the evidence of discolouration shows that the hæmorrhage occurred at the earlier attack. Moreover, we are told the pulse was 72, the temperature was normal, and that she did not look anæmic at the time of operation. We may conclude, therefore, that hæmorrhage had ceased ten days previously to surgical intervention, and infer, I think, safely, as there is nothing in the text or illustration to contradict the inference, that the case was one of tubal abortion, and not of tubal rupture as stated by Mr. Tanner in the title of his paper.

In a large majority of all cases of tubal pregnancy implantation is in the ampulla, and abortion, not rupture, occurs; and after the initial hæmorrhage there is little to be feared from this complication. That Mr. Tanner is conservatively inclined is shown by his respect for the ovary of the same side. I cordially agree with Mr. Tanner in the hope that his patient will not have a tubal pregnancy in the remaining tube. It would be a calamity if she were to lose that too. I am sure Mr. Tanner merely performed the routine practice he has been taught and seen—as I did myself before 1922—without giving thought to the possibility of saving the tube. Nevertheless, we must all be very grateful to him for bringing to our notice an excellent example of Cullen's physical sign. I have fought for many years for conservation of ovarian tissue, and I have for some years tried to evoke a conservative physiological attitude in regard to these much maligned tubes. I hope Mr. Tanner will forgive my raising the point in connexion with his case. If we all sat down and thought and "felt" as others do there would be no progress.

I make no apology for the length of this letter, which does not exhaust all I might say in answer to the questions raised, for the matter is of some moment to many unfortunate young women.

I am, Sir, yours faithfully,

Liverpool, Jan. 29th, 1932. W. BLAIR BELL.

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[1] Brit. Med. Jour., April 18th, 1931.

[2] Jour. Obstet. and Gyn. Brit. Emp., 1922, xxix., 504.

[3] Principles of Gynæcology, 1st ed., 1910, p. 229.

FILLING UP A DEATH CERTIFICATE.

To the Editor of THE LANCET.

SIR,—Dr. A. B. Dunne, in his letter to THE LANCET of to-day's date, complains of the manner in which the medical practitioner allocates the causes of death as between primary and secondary causes and proceeds to give a few instances of what he terms gross error that have come to his notice. He uses the terms "primary cause" and "secondary" in his examples. I should like to point out to him in the first place that the terms primary and secondary unfortunately do not appear on the Official Certificate of Death. If they did, fewer mistakes would be made.

In the second place, I should like to refer to his example No. 2 in which the primary cause appears as hæmatemesis and the secondary as cancer of the stomach. If Dr. Dunne will consult his book of "Forms for Medical Certificates of the Cause of Death" and study page vii., on which appear examples of how a death certificate is to be filled in, he will find example No. 4 which reads as follows :

Immediate cause	Hæmatemesis.
Morbid conditions, if any, giving rise to immediate cause (stated in order proceeding backwards from immediate cause)	Chronic gastric ulcer.

I would suggest that Dr. Dunne, instead of tilting against the medical practitioner, should turn his lance against the authority responsible for the present phraseology on the official forms of notification.

I am, Sir, yours faithfully,

Harley-street, W., Jan. 30th, 1932. C. E. LAKIN.

ERYTHROCYTE SEDIMENTATION TEST.

To the Editor of THE LANCET.

SIR,—The interesting and instructive letter on the above subject by Mr. J. E. R. McDonagh reminds me that about 40 years ago I pointed out that the precipitants of serum albumin in the urine were all dehydrants that removed the water of hydration from the large molecules of albumin, and the permanence of the precipitate depended on the amount of the water of hydration abstracted. Picric acid precipitates the albumin which again passes into solution on the addition of water. I am very glad that you have published his letter, as it has drawn my attention to what I have missed by not previously reading his three volumes on the Nature of Disease. I must now proceed at once with my own edification.

I am, Sir, yours faithfully,

Hindhead, Jan. 29th, 1932. JAMES BARR.

PS.—May I add that I was much interested by the article Massive Enlargement of the Breast, appearing in your current issue by Mr. H. H. Greenwood, as I have cured some such cases by large doses of iodine, and personally I have strong objections to unnecessary operations, whether for æsthetic or any other reason. The breasts should be suspended, but not compressed, so as to lessen all circulatory stagnation. I prescribe about 10 minims of either the English or French tincture of iodine in half a wineglass of milk, thrice daily after meals. If there be any deficiency in calcium it is well to add about grs. 2 of calcium iodide to each dose. The diet should be light and nutritious, not much carbohydrate or table salt. There is always a risk of large doses of iodine giving rise to hyperthyroidism, so the patient should be warned against such a possibility, and advised to pay an occasional visit to her medical attendant. If such an occurrence should occur it is easily remedied by stopping or lessening the iodine and substituting the lactate of calcium and a liberal supply of milk.

EXCURSIONS IN THERAPEUSIS.

To the Editor of THE LANCET.

SIR,—As one who has given an extensive clinical trial of the new methods and materials which Sir Thomas Horder refers to as X.Y.Z. 42, I welcome his address as an indication that the winds of these new doctrines are beginning to blow in high places, even if they evoke but Olympian laughter. The application of these doctrines in this hospital on 1200 control cases and 2000 test cases of diphtheria (as recounted in the *Medical Officer* of Jan. 24th, 1931[1]) has reduced the death-rate from 5·4 per cent. in the former to 2·6 per cent. in the latter. Based on nearly 600 test cases of scarlet fever the renal complications have been reduced from 11 per cent. to under 2 per cent. I have repeatedly seen the temperature fall to normal in 12 hours with a disappearance of the lesion in erysipelas after the exhibition of a suitable drug of this family. I have seen the thrombophlebitis following enteric fever instantly arrested with disappearance of all signs and symptoms in three days instead of the usual three weeks. I have seen cases of chronic boils which have resisted all other therapeutic measures clear up in a few days without recurrence when treated on these principles. These, and many other cases, lead one to think that there must be something in these ideas.

The knowledge of the hypothesis on which these methods are based and the study of the dark-ground picture of the blood are essential, as these drugs are potent for harm as well as good if rashly used. Sir Thomas's remark that "either there are particles in the plasma or there are not" must be regarded as rhetorical, as he must know that "our bodies are composed almost entirely of matter in its colloid (i.e., particulate) state" (E. S. Hedges, D.Sc., "Colloids," 1931). The colloid chemist will tell him that these particles are capable of condensation (flocculation and precipitin reactions) or dispersion (peptisation and lytic phenomena) with alterations in the continuous phase. If he examines sera from various diseases, he will see there are considerable differences in the appearance in their particles compared with the normal serum—in their number, Brownian movements, refractive index, and tendency to flocculate or not. On reading colloid chemistry one is impressed by the number of factors influencing a colloid system and amazed that already such a measure of success is possible therapeutically on these lines, seeing the methods of investigation at our disposal are so extremely crude and liable to very many fallacies. As to whether the hypothesis on which this work is based is correct or not (especially as to whether the effect of drugs is electronic or ionic) is a matter to be determined by the physical chemist, but it would seem that a case has been made out for investigation by experts in that line.

The following quotation is from Dr. Hedges's book :

> "A bird's nest may be made of twigs, straw, wool, and horsehair. The pure chemist is represented by an investigator who makes a thorough study of twigs, &c. . . . but who may not be interested in the most important object of his study—that is a bird's nest. A heap of twigs, &c. . . . does not make a nest, because a definite structure is involved and it is this combination of study of structure as well as chemical composition that forms one of the chief differences between the outlook of pure chemistry and colloidal chemistry. Colloid chemistry is a closer approach to the study of things as they exist."

Has not the tendency of biochemistry been largely to the study of twigs such as blood calcium, sugar or urea, rather than the investigation of the whole nest, the colloid system? Colloid chemistry must have an important bearing on medicine. Mr. McDonagh has made a valiant and, to a considerable degree, successful attempt to bring the researches of colloid chemistry into touch with clinical medicine. Whether his unitarian hypothesis has been stretched too far the future will show. The more recent studies in immunology seem to indicate that physico-chemical phenomena play a large but not the whole part in these events. I venture to prophesy that this will also be the final conclusion in the effects of therapeutic agencies.

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[1] See also THE LANCET, 1930, ii., 579.

I hope that Sir Thomas Horder's address will lead to stimulation of this type of investigation, as very little seems to be known as yet of the behaviour of hydrophilic colloids under the influence of complex compounds.

I am, Sir, yours faithfully,
B. A. PETERS, M.D. Camb.,
Medical Superintendent, Ham Green Hospital
Jan. 26th, 1932. and Sanatorium, near Bristol.

BRONCHOSCOPY IN PULMONARY DISEASE.

To the Editor of THE LANCET.

SIR,—The frequent and important publications of Chevalier Jackson, his personal visits to this country, and the instruction courses which he organises, have been gradually establishing the value of bronchoscopy as a diagnostic and therapeutic measure. Your editorial comment last week on the excellent paper by Dr. Scott Pinchin and Dr. Morlock is well timed and will undoubtedly focus attention on the fact, not generally recognised, that access to the tracheo-bronchial tree by direct methods is possible and useful in a great variety of cases.

Their article is well illustrated by examples. The following two cases which came under my care at the Royal Chest Hospital are of interest.

(1) A.B., aged 24, male. Three years recurrent cough; hæmoptysis; irritation localised to a point under the inner end of the left clavicle. Coarse rhonchi heard over the upper part of the left chest, intensified on coughing. X ray negative. Sputum T.B. negative. Bronchoscopy. Papillomata of trachea and left bronchus discovered and removed. Recovery complete.

(2) C.D., aged 59, male. Six months increasing shortness of breath, eventually causing "gasping" on exertion and "tightness of chest" especially on bending. Winter cough; scanty sputum; occasional blood clots in sputum; loss of weight; no pain. On admission, slight cyanosis; very marked stridor; slight impairment of note and weak breath sounds left upper chest. Bronchoscopy. Large fibroma growing from the anterior wall of trachea just above the bifurcation. Removal through the glottis with complete relief.

A recent comprehensive collection by Ellen J. Patterson[1] of recorded cases of benign growths of the tracheo-bronchial tree revealed only 26 cases, a large percentage of which were diagnosed post mortem. These two cases, operated on within a relatively short time, suggest that what has been thought to be an extremely rare condition may prove to have a much higher incidence when bronchoscopy becomes more generally used as a means of diagnosis, and they raise an interesting consideration as to the extent to which such masses can be effectively removed through a bronchoscope.

While it is certain that bronchoscopy can and will become an important factor in pulmonary diagnosis and therapy, it is equally certain that there are great difficulties in the way of its becoming a method readily available for use outside the regular bronchoscopic clinics. A rigid technique, a complete set of good instruments, trained assistance, practice, and personal aptitude are essential for success. Since familiarity with all conditions of the larynx in health and disease is important, I venture to suggest that bronchoscopy remains a subject which, with few exceptions, is in the province of the laryngologist working in conjunction with physicians interested in diseases of the chest.

I am, Sir, yours faithfully,
London, W.. Feb. 1st, 1932. A. M. ZAMORA.

VACCINE TREATMENT IN INFECTIVE ARTHRITIS.

To the Editor of THE LANCET.

SIR,—Dr. Knyvett Gordon appears to have overlooked the main issue of my paper on the vaccine treatment of infective arthritis—viz., that vaccines given *under the conditions stated* do not yield results measurably superior to other forms of treatment when the series is large enough to permit of analysis, or the results by statistical methods. If Dr. Gordon believes that some other form of vaccine treatment is capable of yielding better results, I feel sure that all who are interested in this insidious and intractable disease would welcome its publication, but unless it is accompanied by data capable of statistical analysis it must be regarded as a personal opinion and not as scientific evidence. I might add that the results of stock and autogenous vaccines in several hundred cases were separately considered, and that the differences were not greater than could be ascribed to chance errors of sampling.

I am, Sir, yours faithfully,
PHYLLIS M. CONGDON.
Devonshire Hospital, Buxton, Feb. 2nd, 1932.

MEDICINE AND THE PRESS.

To the Editor of THE LANCET.

SIR,—The report of the discussion of this subject at the meeting of the Chelsea Clinical Society makes melancholy reading. All the speakers except one seemed to agree that newspaper readers are entirely incapable of exercising any power of independent judgment whatever, but appraise the "worth" of everything they read by the signature appended thereto. One cannot help thinking that this is sad. Sixty years of free education aided by the all-powerful press itself to have produced only this sheep-like mind! But perhaps our "able editors" are deceiving themselves. Let us hope so; for such a type of mind seems, if one may believe a "well-known authority," to be more characteristic of the press itself than the public.

> "But is it a good play, Mr. Bannal? That's a simple question.
>
> "Simple enough when you know. If it's by a good author it's a good play naturally."

I am, Sir, yours faithfully,
CHAS. E. THORNTON.
Beckenham, Kent, Feb. 1st, 1932.

*** *Dr. Thornton's view is the one consistently* held here. If medical information in the public press were put on the basis where political or financial information stands, signatures would only be needed in exceptional circumstances—the prestige of the paper would sign the articles.—ED. L.

REMEMBRANCE DAY IN LONDON.—The money collected in the London district on "Poppy Day" was £96,775. The poppies cost £11,900, and the administrative expenditure was £2492. Other figures are not yet available.

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[1] Act. Oto. Lar., December, 1930.

OBITUARY

JOHN PARLANE KINLOCH M.D. Glasg., M.R.C.P. Edin., D.P.H. Camb.,

CHIEF MEDICAL OFFICER, DEPARTMENT OF HEALTH FOR SCOTLAND.

THE death of Dr. Parlane Kinloch, on Jan. 31st, at the age of 46 years, brings to an abrupt end one of the most brilliant careers in public health administration in our times. His death was quite unexpected. He completed his week's work as usual last Saturday, and succumbed to a heart attack on the Sunday morning.

DR. PARLANE KINLOCH.

[Photograph by Morgan.

John Parlane Kinloch was a native of the Vale of Leven, Dunbartonshire, and was educated at Glasgow High School and Glasgow University, where he graduated M.B., Ch.B. in 1909. In 1910 he took the D.P.H. of Cambridge with distinction, and in 1913 the M.D. of Glasgow with commendation. A series of minor appointments followed. These included house surgeon and house physician in the Victoria Infirmary, Glasgow; resident medical officer in the Queen Charlotte Lying-in Hospital, London; pupil assistant in the Glasgow Public Health Department; and later resident medical officer at Ruchill Fever Hospital, Glasgow. From this last post he was appointed in 1914 deputy medical officer of health for the City of Aberdeen, and lecturer in public health in the University. It was in Aberdeen that he emerged as a force in public health administration. The war, however, interrupted his work. In 1914 he joined the R.A.M.C. (Territorial), and for three years commanded the Aberdeen University Officers' Training Corps. In 1918 he was in charge of a mobile hygienic field laboratory in France. After the war he resumed his appointments in Aberdeen, becoming reader in public health in 1923, and later in the same year succeeded Prof. Matthew Hay as medical officer of health and head of the University public health department. Dr. Kinloch carried to completion the work that Dr. Hay had begun, and he broke into new territory in a way that established Aberdeen as a pioneer city in public health administration. He was an inspiring leader of a team, and the team-work of Aberdeen in research and administration since Dr. Kinloch gave it impetus set the pace in Scotland. The Aberdeen team's studies in ultra-violet irradiation, dysentery, diarrhœal diseases in children, food poisoning, scarlet fever, measles. diphtheria, and maternal mortality have all affected public health practice. Dr. Kinloch was the first medical officer in Scotland to carry out on a comprehensive scale the hospitalisation of pneumonia—a lead which has been widely followed since.

But perhaps his greatest achievement in Aberdeen was to carry through, in the face of much determined opposition, the reorganisation of hospital services in Aberdeen. This reorganisation anticipated by several years the hospital clauses of the Local Government (Scotland) Act, 1929. Before that Act was passed, the poor-law hospital at Woodend had been transferred to the town council, run as an integral part of the city hospital services, and linked coöperatively with the Royal Infirmary and, for teaching and research purposes, with the University. Aberdeen in fact had already achieved what the Local Government Act contemplates for the rest of Scotland. This scheme of Dr. Kinloch's was part of his wider vision of a regional organisation—achieved already in part—and of a service that put all the facilities for modern methods of diagnosis and treatment behind and at the disposal of the general practitioner. He never forgot, nor did he allow his colleagues to forget, that the essential foundation of a good medical service was the general practitioner. Hence his hopes of a revised medical curriculum, the range of service he provided through the Aberdeen laboratories, and many other seemingly unrelated activities.

By 1928, when Sir Leslie Mackenzie retired from medical membership of the Scottish Board of Health, Dr. Kinloch's selection for the post of chief medical officer to the Department which took the Board's place was almost inevitable. He accepted the invitation of Sir John Gilmour, then Secretary of State for Scotland, to fill that office; but he did so with some trepidation, for he loved the close contact with realities which such work as superintendent of Aberdeen hospitals had given him. As chief medical officer for Scotland he was a success from the start. He reorganised and strengthened the medical department and, it may be said without disparagement of others, he humanised it, bringing it to a closer appreciation of the difficulties of medical men and other health workers in the field. He worked always to a vision of a regenerated Scotland, and preached the Greek ideal of physical and mental fitness. He was tormented by the contrast between his dreams and the law's delays, and the thousand and one petty impediments in the way of realising them. This torment flared out now and again; but it did not slacken his grip on the wheel or divert him from the course he had set. By one means and another he communicated his vision to others, not least his colleagues and assistants; he lifted the day's effort out of the humdrum, and related it to an inspiring purpose.

Such a personality, with a creative imagination always in play, could not but influence the direction of policy even in the short space of three years. He opened up new fields for the work of the Medical Research Council in Scotland, and secured the establishment of a scientific advisory committee to initiate and advise on medical investigations in Scotland, and to relate the fundamental work in biology and other sciences to the administration of the health services. Under his inspiration there is in process all over Scotland a knitting together of all the health agencies towards the central purpose of attaining positive fitness in the people. Abroad he was beginning to emerge as an international figure in public health. He has left behind him in the department in Edinburgh many projects and schemes and a whole stock of ideas in the rough. His death is a tragic loss. One administrative colleague summed up the general feeling in the department over his death by the remark: "Kinloch is the one man among us who is irreplaceable."

His work and the loyalty and affection of his colleagues speak for Dr. Kinloch, the man. His faults of temperament and the defects of his qualities did not matter to those who knew his bigness and felt the warmth and generosity of his friendship. He inspired affection and returned it in good measure. He was something of an evangelist. "It's a religion Kinloch has given us and a religion worth fighting for!" was how a Scottish veterinary inspector reflected over Dr. Kinloch's presidential address, entitled "The Science of Life," at the Scottish Sanitary Congress last year. This will serve as a pointer to the effect he produced in his public appearances. He was a born leader, and his death is a heavy blow to the medical profession and the public service of Scotland.

WALTER SMYTH, M.B. R.U.I.

THE death took place on Jan. 24th, in a nursing home in Belfast, of Dr. Walter Smyth, superintendent of the County Antrim Mental Hospital, in his fifty-seventh year. Dr. Smyth took his medical course in the Queen's College, Belfast, and qualified with honours at the early age of 21. Having acted as demonstrator of anatomy and physiology at the Queen's College, he specialised in ophthalmology, and was appointed assistant ophthalmic surgeon at the Royal Victoria Hospital. After a few years he turned his attention to psychological medicine, and was appointed assistant medical superintendent of the Antrim Mental Hospital in 1899, and in 1930 became superintendent. Our Belfast correspondent writes:—"Those who compare the up-to-date mental hospital at Antrim with the conditions which prevailed when he first went there can have some idea of what he accomplished. From the first his senior recognised his great capacity and allowed him ample scope for his gifts of organisation. He loved an outdoor life, and in the development of the farm attached to the hospital he found an additional outlet for his energies. Modest and unassuming he never sought the limelight but was revered by all his medical colleagues and beloved by his whole staff."

THE LATE MAJ.-GEN. H. HENDLEY, I.M.S.

Sir Leonard Rogers writes: I am glad of the opportunity to add a word of personal appreciation of Major-General Harold Hendley, I.M.S., to your full account of his long and varied service in India, during which he showed his competence in both military and civil positions, and eventually rose to high administrative posts. He was a typical example of the best type of I.M.S. officer in the palmy days of the service who was well-qualified to carry out most efficiently any of the multitudinous duties to fall to the lot of this service. His genial and kindly nature endeared him to all with whom he worked and played a large part in his success as an administrative officer. He saw much active military service in his earlier years and was thus well qualified to revert to administrative work on the military side after filling many important posts in the civil department of the Punjab. After his retirement he continued to take a deep interest in medical matters and regularly attended the Dufferin Committee meetings at the India Office where I had the pleasure of working with him, and he was also associated with the work of the Order of St. John of Jerusalem. He will be much missed by his very numerous friends, while I do not think he could ever have had an enemy.

PARLIAMENT

NOTES ON CURRENT TOPICS.

REASSEMBLY OF PARLIAMENT.

BOTH Houses of Parliament reassembled on Tuesday, Feb. 2nd, after the Christmas recess.

THE TRADE BALANCE.

In the House of Commons Major ELLIOT, the Financial Secretary to the Treasury, informed Mr. DENMAN that the approximate amount of revenue received from the duties imposed under the Abnormal Importations (Customs Duties) Act, 1931, to Dec. 31st, 1931, was £290,000.

In reply to Mr. LANSBURY, Leader of the Opposition, Mr. MACDONALD, Prime Minister, said that the Government had been engaged during the recess in studying the trade balance of the country in all its aspects. It had been decided to introduce a Bill to deal with the matter, and the necessary financial resolutions would be proposed by the Chancellor of the Exchequer on Thursday, Feb. 4th. It was the intention of the Government to press forward with the Bill and place it on the Statute Book at the earliest possible date. In view of the state of business before Easter, and particularly the urgency of passing the Trade Bill into law, the Government must regretfully ask private Members to sacrifice their parliamentary time.

TOWN PLANNING BILL.

Sir E. HILTON YOUNG, Minister of Health, in moving the second reading of the Town and Country Planning Bill, said that all the great representative bodies of local government had approved resolutions calling for legislation of this kind. No less than 18 private Acts had been passed conferring on particular local authorities powers similar to those which were being made general in this Bill. It was thought to be much better that those powers should be placed under the control of a public statute than that they should be conferred piecemeal by special private Acts. This Bill gave local authorities power to exercise reasonable foresight and control in planning the development of their localities. It was not a measure to confer arbitrary powers on a distant centralised office, but to put into the hands of the localities themselves powers of controlling their own destinies in these important matters. It was permissive in character. Population had doubled during the lifetime of the present generation, and the overcrowding of the towns made planning and reorganisation necessary to obtain more room for the people. The Bill would not impose restrictions on private enterprise, but it was intended to obtain the greatest measure of liberty and facility for private enterprise in development by means of adjustment in relation to the surroundings of the neighbourhood. Further, the Bill would enhance amenities of life in the country by regulating, for instance, the number of houses to be put up and the space that should be reserved between them. The Bill would enable local authorities to extend town planning schemes to undeveloped land and to land already built over. Power was also given to plan ahead for public improvements. Bigger areas than hitherto would come under the scope of regional planning, and local authorities would be enabled to deal with ribbon development by means of zones and restrictions, &c.

Sir S. CRIPPS intimated that the Opposition would support the Bill.

Sir WALKER SMITH moved the rejection of the Bill on the ground that, apart from the fact that there was far more important business to occupy Parliament at the present time, the measure was unnecessary, and indeed contrary to the public interest.

Lieut.-Colonel FREMANTLE said that the Bill was the only way to preserve the countryside. It was essential to have some kind of control to deal with future development. It was economical to look ahead. They must have this combination of social effort together with individual effort as civilisation advanced. He urged Members of the House to recognise that this Bill was the culmination of a general agreement among those who had studied the question. He had been asked by the London County Council to say that they gave their general support to the second reading of the Bill, although they reserved the right to suggest certain amendments.

After further debate the motion for rejection was negatived. and the Bill was read a second time without a division.

MEDICAL NEWS

University of Cambridge.

On Jan. 29th the following degrees were conferred :—

M.D.—F. W. Law.

M.B. & B.Chir.—M. E. D. Roberts, J. V. Lucas, G. T. Cook, Joseph Sowerbutts, and E. H. Hudson.

M.B.—E. H. W. Lyle, and L. E. Houghton.

B.Chir.—John Hughes, J. B. Tracey, M. A. Rushton, and W. A. C. K. Nanka-Bruce.

Royal College of Physicians of London.

At a meeting of the College on Jan. 28th, with Lord Dawson, the President, in the chair, the following candidates, having satisfied the Censor's Board, were admitted to the Membership :—

Charles Thomas Andrews, M.D. Belf., Philip Shaw Bell, M.B. Lond., Cyril Frank Cosin [illegible] Cowasjee, M.B. Lond., Jo[illegible] Mackenzie Deane, M.B. Melb [illegible] Cape Town, Richard White [illegible] John Enniss, M.B. Melb., [illegible] Panagodage Bertram Fern[illegible] Franklin, L.R.C.P., William James Gardiner, M.B. Toronto, Mohamed Abdel Hamid Gohar, M.B. Cairo, John Gordon, M.D. Leeds, Hagar Hethrington, M.B. Toronto, Edward Weston Hurst, M.D. Birm., David William Stuart Kaye, M.B. Lond., Joseph Victor Landor, M.D. Lond., Marjorie Low, M.D. Lond., Dame Anne Louise McIlroy, M.D. Glasg., Joseph Simdline, M.B. Lond., Adolf Markus Nussbrecher, M.B. Lond., [illegible] Camb., Harry Maynard Rennie, [illegible] Roberts, M.D. Manch., John [illegible], Mazhar Hussain Shah, M.B. [illegible], Neville Alexander Dyce Sharp, L.R.C.P., Mary Broadfoot Walker, M.B. Edin., Edward Johnson Wayne, M.B. Leeds, and Alexander Duncan Shanks Whyte, M.B., New Zealand.

Licences to practise were conferred upon 95 candidates (78 men and 17 women) who have completed the Final Examination of the Conjoint Board and have complied with the by-laws. The following are the names and medical schools of the successful candidates, viz. :—

G. Ashton, Oxford and Univ. Coll. ; H. C. Bamford, St. Bart.'s ; G. N. Barker, St. Thomas's ; H. F. Bateman, Camb. and St. Bart.'s ; H. J. Beard, Manchester ; H. Blumovitch, St. Bart.'s ; L. Bowen, St. Bart.'s ; F. E. Buckland, Oxford and St. George's ; C. Budeiri, M.D. Geneva, London ; A. H. Bulleid, Camb. and Bristol ; Winifred M. Burbury, Camb. and Leeds ; G. W. Causey, Liverpool ; M. Chalkowski, St. George's ; T. A. L. Davies, St. Thomas's ; Jane Druker, M.B. Manch. ; G. C. T. Du Toit, Witwatersrand and St. Bart.'s ; C. D. Evans, Camb. and St. Mary's ; Jennie G. Evans, Westminster ; H. T. Giblin, L.M.S.S.A., St. Mary's ; B. Gilbert, St. Thomas's ; A. M. Gill, Middlesex ; Rachel N. Gillespie, L.M.S.S.A., Royal Free ; A. C. Gladstone, St. Thomas's ; F. J. S. Gowar, Middlesex ; L. E. Green, St. Bart.'s ; Elizabeth M. Handfield-Jones, Oxford ; Joan G. Harcourt, Royal Free ; D. S. Hayes, St. Bart.'s ; S. T. Hayward, St. Bart.'s ; C. L. Heanley, Camb. and London ; W. P. Hedgcock, St. Thomas's ; A. Hollingsworth, St. Thomas's ; M. S. Holzman, London ; E. E. R. Hopkin-James, Camb. and Cardiff ; A. C. Howard, Univ. Coll. ; J. Howell, Camb. and Guy's ; S. V. Humphries, Camb. and St. Thomas's ; K. C. Jeffery, London ; P. W. E. Jones, Camb. and St. Bart.'s ; R. A. Jones, Camb. and London ; Alison F. Z. Judd, Royal Free ; J. J. Kempton, Bristol ; A. Kennedy, St. Thomas's ; E. A. Knappett, Univ. Coll. ; N. Langdon-Down, Camb. and London ; L. W. Lauste, St. Thomas's ; R. A. Q. Lay, Guy's ; O. C. Levine, Johns Hopkins and Univ. Coll. ; D. T. Lewis, St. Mary's ; J. T. R. Lewis, Middlesex ; W. H. Lewis, Camb. and Guy's ; Ethelberta M. Lynton-Low, Royal Free ; Jane S. McDowell, Charing Cross ; J. G. McGrath, Manchester ; N. F. Maclagan, Middlesex ; P. G. C. Martin, Camb. and Manchester ; R. G. Mayall, Camb. and St. George's ; W. A. Mayne, Camb. and St. Thomas's ; E. L. Monkhouse, Guy's : Irene P. Murray, King's Coll. ; P. Nair, Bombay and Royal Free ; P. G. A. Nambiar, Madras and Royal Free ; R. S. Ogborn, Univ. Coll. ; A. H. Osmond, Birmingham ; C. G. Owen, Edinburgh and St. Mary's ; R. H. Patel, Bombay and Birmingham ; J. C. Pedley, Middlesex ; E. D. Portman, Manchester ; S. Prakash, M.B. Rangoon, Charing Cross ; G. Ramage, M.B. Manch. ; J. Reeve, Westminster ; E. R. B. Reynolds, St. Thomas's ; Irene P. Rowlands, Charing Cross ; P. G. Roberts, St. Bart.'s ; H. Rosenberg, Guy's ; H. W. Salmon, Middlesex ; J. L. S. Scott, Camb. and St. Bart.'s ; C. K. Shain, Leeds ; R. F. Simkin, St. Mary's ; R. E. H. Simpson, St. Thomas's ; E. R. Sinton, Birmingham ; W. L. Sleight, Bristol ; W. G. Smith, L.D.S., Cardiff ; W. P. Stamm, Guy's ; Joan W. Stelfox, Liverpool ; M. G. Stratford, Univ. Coll. ; G. H. Taylor, Guy's ; H. C. M. Walton, Camb. and St. Mary's ; Clara M. Warren, Royal Free ; Grace E. Watson, Royal Free ; H. A. T. Wells, L.M.S.S.A., Madras and Guy's ; Shirley E. Whitaker, Univ. Coll. ; H. T. S. Wise, King's Coll. ; F. H. Wood, Birmingham ; W. Woolley, Bristol.

The undermentioned diplomas were conferred (jointly with the Royal College of Surgeons) upon the following candidates :—

Diploma in Public Health.—G. F. Bramley, J. E. Cheesman, M.M.D. Chughtai, S. N. Consul, Doris V. Douglas-Norman, Ruth C. Finn, R. C. Jones, P. M. Kaul, Dorothy M. Llewellin, Janet M. Macmillan, L. D. Richards, F. A. H. Simmonds, J. E. Stokes.

Diploma in Laryngology and Otology.—V. Y. Apte, M. Basheer, V. U. Chitale, N. M. Cuthbert, H. J. Eizenberg, E. W. Ingle, H. Y. Khwaja, D. A. P. Macalister, N. D. Matson, C. K. C. Misra, B. F. Niblock, E. R. G. Passe, M. A. H. Siddiqi.

Diploma in Psychological Medicine.—C. E. Allen, J. C. Batt, F. H. Beare, H. C. Beccle, C. L. C. Burns, E. N. Butler, Irene Dixon, W. J. McCulley, F. L. McLaughlin, J. H. Mulvany, E. U. H. Pentreath, Irene Yates, G. C. Young.

Sir John Rose Bradford was elected a Member of the Executive Committee of the Imperial Cancer Research Fund. Dr. Arthur Shadwell was re-elected the College representative on the Council of the Queen's Institute for District Nursing, and Dr. H. Charles Cameron was appointed a representative on the Child Guidance Council.

The Milroy lectures, on the Rôle of the Hæmolytic Streptococci in Infective Disease, will be delivered by Prof. Cyril Okell on Feb. 18th, 23rd, and 25th, the Goulstonian lectures on the Pathology and Treatment of Anæmia, by Dr. J. L. Witts, on March 1st, 3rd, and 8th, and the Lumleian lectures on the Borderlands of Medicine, by Dr. C. E. Lakin on March 10th, 15th, and 17th, all at 5 P.M. at the College, Pall Mall East.

Society of Apothecaries of London.

At recent examinations the following candidates were successful :—

Surgery.—R. R. Clipstein, St. Mary's Hosp., and R. F. Hawke, London Hosp.

Medicine.—G. S. N. Hughes, St. Mary's Hosp. ; I. S. Lloyd, Royal Colleges, Edinburgh ; and H. C. Pain, Middlesex Hosp.

Forensic Medicine.—M. Belo-Zercovsky, London Hosp. ; W. E. P. Corbett, St. Mary's Hosp. ; R. F. Hawke, London Hosp. ; I. S. Lloyd, Royal Colleges, Edinburgh ; A. J. McBrearty, Queen's Univ., Belfast ; T. D. Norton, Univ. of Sheffield ; B. Rivlin, Univ. of Frankfort and Middlesex Hosp. ; and L. G. Yendoll, Guy's Hosp.

Midwifery.—F. Crowther, Guy's Hosp. ; M. Ditton, Univ. of Munich and Royal Free Hosp. ; and R. G. Joyce, St. Bart.'s Hosp.

The following candidates, having completed the final examination, have been granted the diploma of the Society entitling them to practise medicine, surgery, and midwifery :—M. Ditton, R. F. Hawke, and B. Rivlin.

National University of Ireland.

On Jan. 16th the following degrees and diplomas were conferred in University College, Cork :—

M.D.—W. H. Kelleher.

M.A.O.—D. St. A. Atkins.

M.B., B.Ch., and B.A.O.—P. J. Burke, C. J. Callanan, E. F. McCarthy, P. M. McSwiney, J. J. Murphy, Thomas Nunan, Patrick O'Donnell, John Walsh, and W. F. Whelton.

B.Sc. (Public Health).—Mary C. Cross and P. F. Fitzpatrick.

D.P.M.—C. B. Molony.

Central Association for Mental Welfare.

A course of lectures and clinical work on Mental Deficiency and other Mental Conditions closely allied to it has been arranged by the University of London Tutorial and Extension Classes Council in coöperation with the Central Association for Mental Welfare, and will be held, if enough applications are received, from April 11th to 23rd at the University of London, South Kensington. It is intended for qualified medical practitioners, and will be based on the requirements for the University of London Diploma in Psychological Medicine. Communications should be addressed to Miss Evelyn Fox, c/o University Extension Department, University of London, Imperial Institute-road, South Kensington, S.W. 7.

Medical Society of London.

In view of the present economic condition of the country, the annual dinner of this society will not be held this year.

French Ophthalmological Society.

This society is holding its fiftieth anniversary meeting from July 18th to 21st. It is to be the occasion of special celebrations. Requests for information should be sent to Dr. René Onfray, 6, avenue de la Motte Picquet, Paris VII.

University of Durham College of Medicine.

Twelve lectures and demonstrations on Diseases of Children are being given by Dr. J. C. Spence on Thursdays at 4 P.M., beginning on Feb. 4th, at the Babies' Hospital and Royal Victoria Infirmary, Newcastle. Particulars may be had from the Registrar of the College of Medicine.

Abernethian Society.

Prof. Hugh Cabot of the University of Michigan has promised to give the summer sessional address to the Abernethian Society, St. Bartholomew's Hospital, on Thursday, April 14th. His subject will be Further Travels with the North American Indians, and the address will be given at 8.30 P.M. in the medical and surgical theatre. It will be illustrated by a film.

Institute of Psycho-analysis.

A course of lectures is being given to medical practitioners and students, under the auspices of this Institute, at the London Clinic of Psycho-analysis, 36, Gloucester-place, W. 1, on Friday evenings at 8.30 P.M. during February. The lecturer, Dr. John Rickman, will deal with Psycho-analytical Contributions to Psychiatry, and it is proposed to give time to discussion and questions at the close of each lecture.

Medical History for Nurses.

A course of informal lectures on medico-historical topics to the nursing staff of the East London Children's Hospital was inaugurated on Jan. 29th by Mr. Wilfred Trotter, F.R.S., who took the chair for a lecture on "The Drama of Appendicitis: the Stage and the Actors," by Dr. W. R. Bett, late house surgeon and casualty officer. A vote of thanks to the chairman and to the lecturer was proposed by Sir Ernest Graham-Little, an "old Shadwellian," and heartily carried by a large and appreciative audience which included Sir Buckston Browne, Sir D'Arcy Power, Mr. Warren Dawson, several members of the visiting staff, and nurses from the hospitals in the neighbourhood.

Births, Marriages, and Deaths

BIRTHS.

BLAXILL.—On Jan. 30th, at Crinnis House, Southend-on-Sea, the wife of Bernard Blaxill, M.A., M.B., of a daughter.

FLEMING.—On Jan. 31st, at Finchley-road, N.W., the wife of Dr. Gordon Fleming, of a daughter.

RUSSELL.—On Jan. 24th, at a nursing home, Bradford, the wife of Henry Stewart Russell, M.B., Ch.B., of Oakroyd, Manningham-lane, Bradford, Yorks [illegible]

WILSON.—On Jan. 26th, 1932, at 45, [illegible]
on-the-Hill, to Ruth, wife of Henry [illegible]
—a son.

MARRIAGES.

PURVES—MACWHIRTER.—On Jan. 28th, at Abbots Langley Church, Kenneth MacLennan Purves, M.B., F.R.C.S. Ed., Chagford, Devon, to Catherine Marian Weir, youngest daughter of Mr. W. MacWhirter and the late Elizabeth MacWhirter.

ROBERTS—AYLING.—On Jan. 27th, at Great Doddington, Northants, Michael Edward Dale Roberts, M.B. Camb., to Mary Christabel, younger daughter of Sir William Ayling, I.C.S. (Retired).

DEATHS.

HOPE FOWLER.—At a nursing home, on the 27th ult., Julia, dearly beloved wife of Dr. Wm. Hope Fowler, 8, Midmar-drive and 21, Walker-street, Edinburgh, youngest daughter of the late James Cant, Esq., of Ore Bridge, Thornton, Fife.

GLASIER.—On Jan. 29th, at Cedar Tree House, Madingly-road,
[illegible] a long illness, Howard Glasier, M.A.,
[illegible] Mildenhall), aged 60.
[illegible] 31st, Dr. J. P. Kinloch, Chief Medical
[illegible] for Scotland, aged 46.

MALLAM.—On Jan. 24th, at Norwich, Harry Guy Mallam, M.R.C.S., L.R.C.P. (Retired), aged 58.

REID.—On Jan. 28th, at "Burdale," Seaview-road, The Salterns, South Hayling Island, Robert Galbraith Reid, M.B., C.M., late of Surbiton and London, in his 66th year.

RYLAND-WHITAKER.—On Jan. 28th, at Bruntsfield-crescent, Edinburgh, Joseph Ryland-Whitaker, B.A., M.D. Lond., F.R.C.P. Edin., Lecturer of Anatomy, Surgeons' Hall, Edinburgh, in his 85th year.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Medical Diary

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MONDAY, Feb. 8th.—5 P.M., UNITED SERVICES (at the Royal Army Medical College, Grosvenor-road, S.W.). Paper: Major W. R. Galwey: Some Medical Problems of Mustard-gas Poisoning. Tea will be served in the Mess at 4.30 P.M.

TUESDAY.—5 P.M., THERAPEUTICS AND PHARMACOLOGY. Discussion: Investigation and Treatment of Certain Cases of Disease of Muscle and Nerve. Openers: Dr. A. C. Hampson and Dr. E. C. Warner. Other speakers will take part. 8.30 P.M., PSYCHIATRY. Paper: Dr. Edward Glover: The Principles of Psychiatric Classification.

FRIDAY.—5.30 P.M., CLINICAL. Cases: 4.30 P.M. Dr.
J. F. Halls Dally: 1. [illegible]
Dr. Bernard Myers: [illegible]
East: 3. Coarctation [illegible]
Dr. F. Parkes Weber: 4. Pernicious Anæmia. 5. Orthostatic Œdema. Dr. Hugh Stannus: 6. Neoplasm of Lung. Mr. Harold Edwards: 7. Hæmolymph Angioma. 8. Hemiglossectomy for Carcinoma. 9. Rectal Prolapse. Dr. J. D. Rolleston: 10. Striæ Atrophicæ after Rheumatic Fever. Dr. H. Avery: 11. Unequal Pulses. 8.30 P.M., OPHTHALMOLOGY. (Cases at 8 P.M.) Papers: Mr. Malcolm Hepburn: Differential Diagnosis of Certain White Deposits in the Fundus. Mr. Ernest Clarke: Some Remarks on Tay's Guttate Choroiditis. Cases: Mr. O. Gayer Morgan: 1. Congenital Hypoplasia of the Facial and Oculomotor Nuclei in Association with other Congenital Abnormalities. Miss Rosa Ford: 2. Pigmented Cyst in the Iris. 3. Dislocated Lens which has been in the Anterior Chamber for Two Years. Other cases will be shown.

HARVEIAN SOCIETY OF LONDON.

THURSDAY, Feb. 11th.—8.30 P.M., Discussion in Paddington Town Hall on the Value of Endoscopic Methods. Openers: Mr. V. E. Negus (Trachea and Bronchi) and Mr. H. S. Souttar, (Œsophagus).

MEDICAL SOCIETY OF LONDON.

MONDAY, Feb. 8th.—8.30 P.M., Discussion on Chronic Toxic Cholecystitis. (Openers: Mr. Harold Dodd and Dr. Arthur Davies.)

WEST LONDON MEDICO-CHIRURGICAL SOCIETY.

FRIDAY, Feb. 12th.—7.15 P.M., Dinner Meeting at the Rembrandt Hotel. Discussion: Public Health Work in its Relationship to the General Practitioner. Openers: Dr. J. B. Howell and Dr. James Fenton.

PADDINGTON MEDICAL SOCIETY.

TUESDAY, Feb. 9th.—9 P.M. (at the Great Western Royal Hotel, Paddington). Dr. W. S. C. Copeman: The Spa Treatment of the Rheumatic Diseases. The address will be illustrated by a film.

BIOCHEMICAL SOCIETY.

FRIDAY, Feb. 12th.—5 P.M. (at the Lister Institute, Chelsea Bridge-road, S.W.). Communications.

WEST KENT MEDICO-CHIRURGICAL SOCIETY, Miller General Hospital, Greenwich, S.E.

FRIDAY, Feb. 12th.—8.45 P.M., Dr. W. Smith: How Pathology Can Help the Clinician.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, W.C.

MONDAY, Feb. 8th.—5 P.M., Dr. J. A. Ryle: Natural History of Duodenal Ulcer.

WEDNESDAY.—5 P.M., Prof. H. A. Harris: Comparative Anatomical Aspect of Disease with Special Reference to Bone Growth.

FRIDAY.—5 P.M., Prof. Harris (second lecture).

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, Feb. 8th, to SATURDAY, Feb. 13th.—MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W. Wed., Dr. Maurice Davidson: The Treatment of General Management of the Phthisical Patient, 4 P.M. Open to Members only.—KING'S COLLEGE HOSPITAL, Denmark Hill, S.E. Thurs.,
3–4 P.M., C [illegible] Terence
East.—ST. [illegible] W.C.
Fri., 3 P.M., [illegible] ises by
Mr. Malcolm [illegible] IPTION,
Brompton. [illegible] of the
Chest. All [illegible] OMEN,
Arthur-street [illegible] ynæco-
logy. All [illegible] cester-
square. Post-graduate Course in Dermatology.
Daily at 2 and 6. Lectures, 5 P.M. Tues. and Thurs.—
ROYAL FREE HOSPITAL, Gray's Inn-road, W.C. Fri.,
5 P.M., Antenatal Demonstration by Dame Louise
McIlroy. Further particulars from the Fellowship.

UNIVERSITY COLLEGE HOSPITAL MEDICAL SCHOOL, University-street, W.C.

TUESDAY, Feb. 9th.—5.15 P.M., Prof. A. E. Boycott: Hypertrophy and Atrophy.

CHARING CROSS HOSPITAL MEDICAL SCHOOL.
SUNDAY, Feb. 7th.—10.45 A.M., Dr. K. S. Smith: Angina Pectoris. 11.45 A.M., Mr. E. A. Crook: Diagnosis of Diseases of the Rectum.

KING'S COLLEGE HOSPITAL MEDICAL SCHOOL, Denmark-hill, S.E.
THURSDAY, Feb. 11th.—9 P.M., Mr. J. B. Hunter: Chronic Appendicitis.

ST. BARTHOLOMEW'S HOSPITAL MEDICAL COLLEGE, West Smithfield.
MONDAY, Feb. 8th, and following THURS. and FRI.—5.30 P.M., Dr. L. Findlay: Feeding and Nutritional Disease of the Infant.

GUY'S HOSPITAL, London Bridge, S.E.
MONDAY, Feb. 8th.—5 P.M., Prof. H. A. Harris: The Use of X Rays in Physiological Investigations.

ROYAL NORTHERN HOSPITAL, Holloway-road, N.
TUESDAY, Feb. 9th.—3.15 P.M., Dr. B. Williamson: Heart Failure.

HAMPSTEAD GENERAL AND NORTH-WEST LONDON HOSPITAL.
WEDNESDAY, Feb. 10th.—4 P.M., Dr. S. Wallis: Artificial Pneumothorax.

NATIONAL HOSPITAL, Queen-square, W.C.
MONDAY, Feb. 8th.—2 P.M., Dr. Riddoch: Out-patient Clinic. 3.30 P.M., Dr. Symonds: Disseminated Sclerosis and Allied Conditions.
TUESDAY.—2 P.M., Dr. Walshe: Out-patient Clinic. 3.30 P.M., Dr. Grainger Stewart: Vascular Lesions of the Spinal Cord.
WEDNESDAY.—2 P.M., Dr. Martin: Out-patient Clinic.
THURSDAY.—2 P.M., Dr. Kinnier Wilson: Out-patient Clinic. 3.30 P.M., Dr. Critchley: Cerebral Sclerosis of Childhood.
FRIDAY.—2 P.M., Dr. Adie: Out-patient Clinic. 3.30 P.M., Dr. Walshe: Cerebral Tumours.

CITY OF LONDON MATERNITY HOSPITAL, City-road, E.C.
THURSDAY, Feb. 11th.—5.30 P.M., Dr. S. Owen: The Newly-born Baby.

ST. PETER'S HOSPITAL, Henrietta-street, W.C.
WEDNESDAY, Feb. 10th.—3 P.M., Mr. A. H. Harkness: Treatment of Acute Gonorrhœa.

ST. MARK'S HOSPITAL, City-road, E.C.
THURSDAY, Feb. 11th.—4.30 P.M., Mr. C. N. Morgan: Surgical Anatomy of the Rectum, &c.

LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital, 49, Leicester-square, W.C.
TUESDAY, Feb. 9th.—5 P.M., Dr. H. C. G. Semon: Diseases of the Buccal Mucous Membrane.
THURSDAY.—5 P.M., Dr. H. Haldin-Davis: Pruritus, Prurigo, Lichenification.

SOUTH-WEST LONDON POST-GRADUATE ASSOCIATION, St. James' Hospital, Ouseley-road, Balham.
WEDNESDAY, Feb. 10th.—4 P.M., Dr. H. W. Barber: Common Skin Diseases.

CENTRAL LONDON THROAT, NOSE, AND EAR HOSPITAL, Gray's Inn-road, W.C.
FRIDAY, Feb. 12th.—4 P.M., Mr. N. Rankin: Differential Diagnosis in a Case Complaining of Nasal Discharge.

MEDICAL SOCIETY OF INDIVIDUAL PSYCHOLOGY, 11, Chandos-street, Cavendish-square, W.
THURSDAY, Feb. 11th.—8.30 P.M., Dr. James Young: Individual Psychology and its Philosophical Implications.

NATIONAL COUNCIL FOR MENTAL HYGIENE.
WEDNESDAY, Feb. 10th.—5.30 P.M. (at 11, Chandos-street, Cavendish-square, W.). Mr. George Ives: Penal Methods of the Past and Present.

ST. MARY'S HOSPITALS, Manchester.
FRIDAY, Feb. 12th.—4.15 P.M. (at the Whitworth-street West Hospital), Dr. Lacey and Dr. Addis: Antenatal Demonstrations.

ROYAL INSTITUTE OF PUBLIC HEALTH, 37, Russell-square, W.C.
WEDNESDAY, Feb. 10th.—4 P.M., Dr. M. B. Ray: Prevention and Treatment of Industrial Rheumatism.

FACULTY HALL, St. Vincent-street, Glasgow.
TUESDAY, Feb. 9th.—4 P.M., Dr. D. Baird: Infective Conditions of Urinary Tract during Pregnancy, &c.

EAR, NOSE, AND THROAT HOSPITAL, Glasgow.
WEDNESDAY, Feb. 10th.—4.15 P.M., Demonstration by the Staff.

INDEX TO "THE LANCET," VOL. II., 1931.

THE Index and Title-page to Vol. II., 1931, which was completed with the issue of Dec. 26th, is now ready. A copy will be sent gratis to subscribers on receipt *of a* post-card addressed to the Manager of THE LANCET, 7, Adam-street, Adelphi, W.C.2. Subscribers who have not already indicated their desire to receive Indexes regularly as published should do so now.

Appointments

FRASER, K., M.B., Ch.B. Aberd., D.P.H., has been appointed Medical Officer of Health for Cumberland.

HAMILTON, D. R., M.B., Ch.B. D.P.H. Glasg., D. P.H., Medical Officer of Health for Shipley.

HENDRY, M.D., B.S. Lond., one of the Medical Referees under the Workmen's Compensation Act for the Districts of the Daventry and Rugby County Courts (Circuit No. 23).

SANKEY, J. N., M.B. Birm., F.R.C.S. Eng., Surgeon for out-patients, Queen's Hospital, Birmingham.

STRÖM-OLSEN, ROLF, M.B., B.Ch., D.P.M., Senior Assistant Medical Officer, Cardiff City Mental Hospital, Whitchurch, near Cardiff.

Vacancies

For further information refer to the advertisement columns.

Ards District Hospital, Northern Ireland.—M.O. £500.
Ashton-under-Lyne, District Infirmary.—H.S. At rate of £150.
Auckland General Hospital, New Zealand.—Med. Supt.
Birmingham, Selly Oak Hospital.—Biochemist. £400.
Birmingham and Midland Eye Hospital.—Res. Surg. O. £150.
Bradford Municipal General Hospital, St. Luke's.—H.P.'s and H.S.'s. Each at rate of £200.
Brighton, New Sussex Hospital, for Women and Children.—H.P. and H.S. Each £100.
Brighton, Sussex Eye Hospital.—Hon. Asst. Anæsthetist.
Brighton, Sussex Maternity and Women's Hospital.—Res. H.S. £130.
British Institute of Radiology, 32, Welbeck-street, W.—Sub-Editor.
Cambridge, Addenbrooke's Hospital.—H.P. At rate of £130.
Cardiff, Canton Medical Relief District.—Temp. M.O. £200.
Central London Throat, Nose, and Ear Hospital, Gray's Inn-road, W.C.—Asst. Surg. Also Third Res. H.S. At rate of £75.
Charing Cross Hospital.—Res. M.O. £350.
Derby, Derbyshire Royal Infirmary.—Cas. O. £150.
Dorchester, Dorset County Hospital.—H.S. At rate of £160.
Dudley, Guest Hospital.—H.S. £200. Also Asst. H.S. £170.
East London Hospital for Children, Shadwell, E.—Dermatologist.
Great Yarmouth General Hospital.—Sen. and Jun. H.S.'s. At rate of £150 and £140 respectively.
Hospital for Consumption and Diseases of the Chest, Brompton, S.W.—Asst. for Dept. of Pathology. £350. Physician. Also Asst. Physician.
Hospital for Sick Children, Great Ormond-st., W.C.—Cas. O. £400.
Kendal, Westmorland County Hospital.—H.S. At rate of £200.
Kettering and District General Hospital.—Res. M.O. At rate of £200.
Liverpool Royal Children's Hospital.—Two Res. M.O.'s for Heswall Branch. Each at rate of £120. Also Two Res. H.P.'s and Two Res. H.S.'s for City Branch, Myrtle-street. Each at £100.
Liverpool, Royal Southern Hospital.—Cas. O. At rate of £100. Also Two H.S.'s, M.O., and Res. Anæsthetist. Each at rate of £60.
Liverpool University.—Jun. Lecturer for Dept. of Pathology. £300.
London Hospital, E.—Med. First Asst. and Reg. £300.
Lucknow University.—Professor of Anatomy. Rs. 1000–50–1400 per mensem.
Manchester, Ancoats Hospital.—Two H.S.'s. Each at rate of £100. Also Med. Reg. £50.
Manchester Hospital for Consumption and Diseases of the Throat and Chest.—Res. M.O. for In-patient Dept. £200.
Manchester and Salford, Hospital for Skin Diseases.—H.S. At rate of £100.
Metropolitan Hospital, Kingsland-road, E.—Surgeon.
Newcastle-upon-Tyne, Royal Victoria Infirmary.—Jun. Surg. Reg. £150.
Norwich, Norfolk and Norwich Hospital.—H.S. £120.
Nottingham Children's Hospital.—Res. H.P. At rate of £150.
Nottingham General Dispensary, Broad-street.—Res. Surgeon. £250.
Nottingham Hospital for Women.—H.S. At rate of £150.
Oldham, Boundary Park Municipal Hospital.—Res. Asst. M.O. £200.
[illegible] *'s Hospital, W.*—Hon. Dental S. and [illegible] patients.
[illegible] *Hospital, 234, Great Portland-street, W.*—Hon. Dental Surgeon.
Royal Waterloo Hospital for Children and Women, Waterloo-road, S.E.—Hon. Ophthalmic Surgeon.
St. Thomas's Hospital.—Phys. to Out-patients.
Salford Royal Hospital.—Gen. Supt. and Sec. £600.
Salisbury, General Infirmary.—H.P. £150.
[illegible] *tford, Kent.*—Res. Med. Supt. £1100.
[illegible] *for Children, Sydenham, S.E.*—Res. M.O.
South-Western Fever Hospital, London-road, Stockwell, S.W.—Res. Med. Supt. £900.
Talgarth, Breconshire, South Wales Sanatorium.—Asst. Res. M.O. £250.
Tunbridge Wells and Counties General Hospital.—H.S. £160.
W [illegible] lic Surgeon.
W [illegible] .—Non.-Res. Cas. O. [illegible] Asst. Anæsthetist.
W [illegible] *d, N.W.*—Hon. 2nd Radiologist.

The Chief Inspector of Factories announces a vacancy for a Certifying Factory Surgeon at Chipping Norton.

NOTES, COMMENTS, AND ABSTRACTS

THE TREATMENT OF PERSISTENT OFFENDERS.*

BY HAROLD FREIZE STEPHENS, M.R.C.S.,
MEDICAL SUPERINTENDENT, COLESHILL HALL COLONY,
NEAR BIRMINGHAM.

THE "somewhat serious disturbance" that occurred recently at the Dartmoor Convict Prison should serve to emphasise the need of dealing more effectively with the persistent offender, especially in the days of his youth and before he has begun that career of anti-social activity which renders him a nuisance and a menace to the State.

For all practical purposes persistent offenders may be divided into two groups: the persistent petty offender and the habitual criminal. The first group contains that heterogeneous collection of weak-minded persons that has always been found in prison, and for whom a modified prison discipline has gradually evolved. Some of these persons become certifiable under the Lunacy Acts and are transferred to mental hospitals, but for the majority of them special observation and training has to be provided. Since 1914, however, a large proportion of these weak-minded offenders, who were continally in and out of prison, have been dealt with under the Mental Deficiency Acts. These Acts have proved a great boon to the Prison Medical Service. They set up new standards to which persistent offenders could be referred and by means of which they could be examined and judged. It is computed that since they came into operation in 1914 the daily average prison population has been reduced by at least 200. Much more remains to be done in this respect. The shortage of institutional accommodation for mental defectives throughout the country is still very serious. The absence of such provision is directly responsible for many of these unfortunate persons falling into crime and is a grave injustice to them. The present position is most unsatisfactory, and in the public interest it is very necessary that the local authorities should endeavour to cope with it as soon as possible.

The Weak-minded Offender.

Some of the earlier workers under the Mental Deficiency Acts were inclined to go to extremes, and a few years ago it was asserted that a very large proportion of all offenders were mental defectives. Careful examinations since then have shown that these statements were exaggerated. Without such examinations, however, this knowledge could not have been obtained. There is in our prisons to-day a considerable class of the persistent petty offender, the members of which manifest some mental abnormality that does not render them capable of being dealt with either under the Lunacy or the Mental Deficiency Acts. New definitions and standards would appear again to be required. These can be attained only by a series of investigations by trained observers, and it is desirable that this research work should be undertaken as soon as possible.

Our Prison Medical Service is probably the finest in the world. Its officers pay special attention to the study of psychology and of mental disease and they are a devoted band of workers. At best, however, their experience is limited, and they certainly would be the first to welcome consultative coöperation with recognised experts outside the Service. Such professional assistance should be available for their use not only for the research work here suggested but on all occasions on which it may be necessary. For some years now a panel of educational advisers has afforded useful assistance in connexion with the training in our local prisons. A panel of psychological advisers, composed largely of medical psychologists, should prove to be equally valuable.

The psychological understanding of the persistent offender should begin, however, before his entry into prison. Our stipendiary magistrates and our justices of the peace are second to none in their appreciation of this fact and of the value of dealing with the individual rather than with the offence. It is desirable, therefore, that they should have the assistance of specially qualified social workers, of psychiatrists and physicians, in order that they may be provided with reliable reports of the physical, psychological, and environmental aspects of the offenders with whom they have to deal. Towards the same end coöperation should be established between our courts and the early treatment centres now being instituted under the Mental Treatment Act.

Supervision and Training.

The second group of persistent offenders is composed of the habitual criminals. These are dealt with to-day in accordance with the requirements of the Prevention of Crime Act, 1908, as amended by the Criminal Justice Administration Act, 1914, and the Indictments Act, 1915. The Prevention of Crime Act, 1908, consists of two parts. Part I. is concerned with the reformation of young offenders and initiated "the Borstal System." Part II. introduces the principle of "preventive detention" in the treatment of the habitual criminal. The Borstal system deals with persons of 16 to 21, and may be extended to those of 23 years of age, where such persons are convicted on indictment of such offences as render them liable to be sentenced to penal servitude or imprisonment, and it appears to the Court that, by reason of their criminal habits or tendencies, or because of their association with persons of bad character, it is expedient that they should be subject to a period of training in a Borstal institution, such period being for not less than two nor more than three years. Preventive detention is applicable to those persons who since attaining the age of 16 years have at least three times previously to the conviction of the crime with which they are charged been convicted of a crime, and it is found that they are leading persistently a dishonest or criminal life. By the system of preventive detention habitual criminals sentenced to penal servitude can receive for the protection of society an additional sentence of prolonged seclusion under less rigorous conditions in a special establishment for a period of not less than five and not more than ten years.

The Prevention of Crime Act, 1908, therefore, is capable of dealing with offenders from the age of 16. English law, however, has provided for their treatment before that age. Thus, "delinquent" children under 12, or under 14 if not previously convicted, and "convicted" children over 12 and under 16 at the time of conviction may be sent for training in a Home Office school. The Probation Acts, moreover, may be invoked on behalf of children of all ages. Means accordingly are available for the satisfactory supervision of a possible persistent offender from an early age.

Unfortunately, in many cases these facilities have not been used, and in many others the valuable institutional training thus provided has been delayed unduly long. Many have been placed on probation who should have been committed to Home Office schools or Borstal institutions. Many have been sent to Borstal institutions who would have had a better chance of reformation had they been sent to Home Office schools at an earlier age; many, too, have been sent for Borstal training at the age of 19 or 20 years who might with advantage to themselves and others have been sent for such training when they were 16 to 17 years old. These lapses in the administration of the law, largely due to false sentiment, are to be regretted. It is to be hoped that means will be found to limit the frequency of such lapses in future. It cannot be emphasised too frequently nor too forcibly that when the offender is found to require training away from his home and surroundings the earlier he is sent to a Home Office school or a Borstal institution the more certain are the chances of his reform. Not to afford the young offender these facilities when he is in need of them is to treat him with unnecessary injustice.

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* Based on a paper prepared for the National Council for Mental Hygiene, and submitted on their behalf to the Committee on Persistent Offenders appointed by the Home Office.

Moreover, in accordance with the law as it stands to-day, it is necessary that the period of detention, in school or institution should be specified by the court in each case. This has serious disadvantages. As the court is unable to forecast the future it is unable to tell exactly how long a period should prove necessary for the reformation of any particular offender. There are lads who, on leaving the Home Office school, would benefit by a period of detention in a Borstal institution. In the case of the majority of the entrants to these institutions a sentence of three years should suffice; in the case of others, three years would not be enough. There are men to-day who, in spite of Home Office school and Borstal commitments, are unable to live as law-abiding citizens. The aim of the system should be, as our enlightened courts are well aware, not so much the serving of a sentence as the training of an individual. If that training should require a longer time in the case of certain individuals, then that extra time should be available for them. Definite sentences of fixed duration preclude the possibility of such an arrangement; in certain cases the Home Secretary has powers to prolong the period of training, but usually the training ceases when the sentence comes to an end, unfit though the individual may be to resume a free life in the community. This is unfair both to the individual and to the community. In dealing with persistent offenders "the indeterminate sentence" should prove to be more effective.

The Indeterminate Sentence.

The idea of the indeterminate sentence has been discussed in Europe for many years. It is an old English idea, and appeared first in the cruder forms of the transportation and ticket-of-leave systems that prevailed here in the eighteenth century. It owes its modern revival to America where the indeterminate sentence has a different meaning to that by which it usually is understood in Europe, and possibly also in England to-day. In Europe the indeterminate sentence appears to mean what we in England now know as preventive detention; it seems to signify a state of more or less perpetual segregation for the socially unadaptable, whether these are those who, by repeated acts, cause trouble and nuisance to the community, such as vagrants and drunkards, or those who, by persistence in serious crime, tend to become a terror and a menace to the State. Such a conception of the indeterminate sentence emphasises its value chiefly as a custodial measure, and, in the opinion of many, would make of it a terrible instrument of social retaliation which would tend to increase rather than to diminish the incidence of serious crime. In America, however, the indeterminate sentence is regarded as a useful instrument of reform, and about 40 States of the Union have accepted it as such. In these States it is considered to be not so much a measure of security, of communal protection against the hardened habitual criminal or social nuisance, as a means of affording the offender such supervision, control, and training as will enable him to learn to avoid, actively to resist, and even to detest a life of continual crime. It is this conception of the indeterminate sentence that is adopted in this paper. So considered, this useful invention becomes a measure of greater hope and value in the treatment of the persistent offender, especially if he is not of mature age.

According to this ideal the principle of the indeterminate sentence may be said to contain three essential elements. These are: (1) a sentence of indefinite duration as to time so as to enable the offender to be kept under supervision and control until he is reformed; (2) the application during this period of appropriate methods of mental, moral, and physical training calculated to effect that reformation; (3) the subsequent granting of parole and licence so arranged as to test the results of the training and the durability and value of the reformation prior to the offender's final discharge.

The Road to Reform.

The fixed sentence, as has been pointed out by several observers, carries with it little or no influence on character or disposition. The prisoner knows the extreme limit of his confinement. If it is short, he bears with it, and concentrates his thoughts on plans for pursuing his predatory instincts with greater caution in the future. If the period of the sentence is long, the criminal may strive by a show of good conduct to obtain an earlier release; but his way to it is through quiet and docile behaviour and an appearance of virtue, and not through a better training for the struggle of life or a greater disposition to face it with courage and honesty. His plan is to impress his jailers and not to improve himself. On the other hand, as the late Viscount Cave maintained, when an offender is sentenced to a restraint to which no fixed limit is assigned, but with an intimation that his fate lies in his own hands, that if he will but use the opportunities of self-improvement which are offered to him and fit himself bodily and mentally for an ordinary decent life, release will be his—his thought and his desires receive a new impetus; he turns to the tasks which are set to him and strives through their accomplishment to gain freedom and a new existence. In doing so he attains to a clearer vision and a better knowledge of himself and eventually achieves a habitus of life that is not consistent with criminal tendencies.

Preventive detention as at present applied in England is of little reformative value, as in practice it tends to become available only for the middle-aged whose habits are already formed. A complete change in the attitude of mind of such persons is of rare occurrence. The principle of the indeterminate sentence as outlined in this paper and rendered applicable to all offenders up to the age of 30 years would be a surer means of preventing the development of the habitual criminal. Its adoption would require the institution of a post-Borstal establishment in the form of a training colony for persons of 21 to 30 years of age. For persistent offenders over the age of 30 on whom systematic training for a period of years has had no beneficent effect there would still be available, as at present, the preventive detention prisons, places of custodial care, as distinct from the Home Office institutions for intensive and systematic training.

There would be then three stages on the road to reform—the Home Office school, the Borstal institution, and the adult training colony. The links between these stages would be the probation system and the Borstal Association. If necessary, progress between the three stages would be continuous so that the training of any particular individual need not be interfered with from school to colony. In this scheme probation would play an important part. It would be used to the fullest possible extent, but only in suitable cases. It would never take the place of necessary institutional training. The complete system of school, institution, and colony should be under the control of a small body of experienced persons appointed by the Prison Commission for the whole country and giving their whole time to the work. Only from such a board of control could uniform and skilled methods of administration and treatment be expected. Further, an advisory committee of medico-psychological and educational experts should be available for consultation by this board of control. Finally, the whole scheme of training thus outlined would fail to function satisfactorily without a comprehensive system of effective after-care. The work of the Home Office schools and Borstal Association in this respect should be maintained. Their efforts should be coördinated, and, where necessary, augmented by the establishment of local committees. These committees would best be organised by the local education authorities, the local probation committees and voluntary societies interested in this work being represented on them.

Summary.

One of the results of the working of the Mental Deficiency Acts was to reduce the number of persistent offenders in prison, where there is still a vast amount of clinical material for psychological examination.

Research should elicit data on which new statutes could be based, the effect of which would be still further to reduce the number of persistent offenders. To help with this research work a panel of psychological advisers should be available for local prisons.

For such offenders as remained to be dealt with by the prison authority systematic training should be available in Home Office school, Borstal institution, and a new type of establishment to be known as the *adult training colony* for offenders from 21 to 30 years of age. For persistent offenders over the age of 30 the preventive detention prisons should be retained.

The complete training system of school, institution and colony should be under the direction of a central board of control who should have the assistance of an advisory committee of medico-psychological and educational experts.

The principle of the indeterminate sentence should be applied to all offenders receiving such training, which, if necessary, should be continuous from school to colony.

In connexion with the use of the indeterminate sentence there should be neither a maximum nor a *minimum period fixed by statute.*

The final discharge of offenders under such sentences should be in the power of the central board of control, who should have absolute authority in the matter.

Provision should be made for the periodic review of the progress of each offender under training with a view to his parole, subsequent licence, and final discharge. Local after-care committees should be organised as part of the general scheme of communal supervision.

To enable the courts to effect correct commitments *in the first instance*, the services of specially trained social workers, psychiatrists, and physicians should be available for their consultation, and coöperation should also be established between the courts and the early treatment centres under the Mental Treatment Act.

PHILOSOPHY AND AFFAIRS.

FROM a group of distinguished signatories we have received the following letter:—

"In the multitude of causes that appeal to the British public, philosophy might seem to be the last that has a claim on the attention of practical men. But it is not difficult in the present disorganisation of beliefs in fundamental principles that is manifest in every department of life to see the need of a cultivation of systematic thought that has the most intimate bearing upon practice. We venture, therefore, to invite public attention to the work of the British Institute of Philosophy.

"Founded in 1925, with the late Lord Balfour as its president, the institute has now a membership of over 1400, which includes in addition to the general body of members, almost all the representative philosophers in Great Britain as well as many distinguished scientists. The institute publishes a quarterly review, *Philosophy*; it holds courses of lectures and organises reading circles; it arranges for the delivery of addresses by men of authority. In addition to the work which is being done in London, there are active local centres in Bangor, Cardiff, Liverpool, Newcastle and Durham, and Sheffield.

"The institute is anxious that its work should be more generally known, in order that an enlarged membership may open to a wider public an opportunity to study the principles that underlie human experience and action in science, art, politics, morals, and religion. Those of your readers who would desire to become members of the institute (the subscription is one guinea including the quarterly review), or to obtain further information with regard to it, are invited to communicate with the Director of Studies at the rooms of the institute in University Hall, 14, Gordon-square, London, W.C. 1."

This invitation is signed by Prof. S. Alexander, O.M., Sir Arthur Eddington, F.R.S., the Archbishop of York, the Dean of St. Paul's, Prof. A. D. Lindsay, Sir Oliver Lodge, F.R.S., Prof. J. H. Muirhead, Earl Russell, F.R.S., Lord Rutherford, O.M., Sir Herbert Samuel, and Prof. W. R. Sorley.

BRITISH MILK INDUSTRY.

AT Guildford, at the last annual general meeting of the Cow and Gate Co., Ltd., Mr. H. J. Suenson-Taylor, the chairman of the company, made some interesting remarks referring to a recent statement of the Minister of Agriculture to the effect that public money could only be spent on an inquiry into the milk industry of the country when there was a definite indication that the industry was prepared to go forward. He added that, if those interested in milk production were going to ask for protection against certain forms of milk coming into the country, they must give indications that they would be able to replace these products. Mr. Suenson-Taylor took up the challenge by saying that, as far as his company was concerned, it was ready to extend factories and plant in response to assurance of reasonable legislation designed to restrict imports brought into the country at less than the cost of home production and transport charges. The company obtains great public support and the statement by its chairman that the success achieved accrues to the public benefit is justified by the standard of its productions.

ACUTE ILLNESS DURING PREGNANCY.

Prof. J. A. NIXON writes from the Department of Medicine of the University of Bristol:—

"I am trying to collect information as to the effects of acute illness during pregnancy upon the child, should it be born alive and survive its birth. *I should be very much obliged to any of your readers* who can send me any data, particularly with reference to developmental defects either physical or mental."

PEPSIN TREATMENT OF PEPTIC ULCER.

Messrs. Paines and Byrne, Ltd., of 31, Southampton-street, Fitzroy-square, London, W.1, inform us *that* they have a stock of the pepsin injections mentioned by Prof. K. Glaessner, of Vienna, in his paper in THE LANCET of Jan. 9th.

SOCIETY OF MEDICAL OFFICERS OF HEALTH: *Fever Hospital Services Group.*—A meeting of this group was held in London on Jan. 29th at which Dr. E. W. Goodall, the President, delivered a presidential address on Some Prebacteriological Views on Infectious Disease. Confining his attention chiefly to the period immediately preceding the inception of the germ theory of disease—that is about a century ago—he pointed out that Fracastor's views on the nature of contagion had been forgotten, and he quoted from various authors to show that few believed in the contagium vivum, and that the doctrine of spontaneous generation was widely accepted. The occurrence of epidemics was attributed to miasms, and contagion was held to play no or only a secondary part in their production. He dealt lastly with the classification and nomenclature of the infectious diseases, drawing attention to the differences between old and modern methods and giving an outline of the growth in knowledge of the different disorders which were included at one time under the term "*continued* fever." Dr. E. H. R. Harries proposed and Dr. Sage, Sutherland, seconded a vote of thanks to Dr. Goodall.

ADDRESSES AND ORIGINAL ARTICLES

THE NATURAL HISTORY OF DUODENAL ULCER.*

BY JOHN A. RYLE, M.D., F.R.C.P. LOND.,
PHYSICIAN TO GUY'S HOSPITAL.

THE subject of this lecture is one which has engaged the thoughts of physicians and surgeons for a quarter of a century, but which still supplies them with unsettled problems. Mindful of the title of this office and of my inability to expound the anatomical or the surgical precepts of John Hunter, I have felt that I might at least, in humble fashion, demonstrate my devotion to the observational method of John Hunter the naturalist. The physician is or should be, above all, a student of the natural origins, associations, and sequences of disease, and in this capacity he can best render his contribution to prognosis and to therapeutic principle.

During the past 12 years I have had considerable opportunities of studying the problems of duodenal ulcer both at hospital and in the course of private practice. My close association with Dr. A. F. Hurst and his thorough methods of inquiry has furnished a constant stimulus, and I have been indebted to my friends, the surgeons and the radiologists for much instruction. Increasing familiarity with the disease has bred anything but contempt. Each year there have been new observations to record and new explanations to seek. The vast fund of information in the literature and the steady output of special researches on the subject notwithstanding, a broad review of the natural history of ulcus duodeni is, I believe, justified by the following four considerations:—

1. Duodenal ulcer is a prevalent disease, and there is evidence (although due allowance must be made for growth and concentration of population and for improvements in diagnosis) that this prevalence waxes rather than wanes under the existing conditions of civilised life.

An inquiry into the admission-rates of some common diseases at Guy's Hospital shows that, on the average, 100 cases of duodenal ulcer are admitted annually—that is to say, about 1 per cent. of all admissions—a figure somewhat less than the admission-rate for tuberculosis (all forms) but greater than that for all the pleurisies and lobar pneumonias combined. In addition, large numbers of cases are treated in the out-patient department. In my private practice, which has a general character—albeit with an abdominal bias—the ten most frequent diagnoses are duodenal ulcer, anxiety state, constipation, cholecystitis and gall-stones, hyperpiesia (with its cardiac and neurological sequels), tuberculosis, anæmia (all forms), migraine, spastic colon, and obesity. Of these, duodenal ulcer heads the list, accounting for approximately 5 per cent. of all my cases.

Wilkie,[1] stressing the steady increase in the cases of perforation at the Royal Infirmary, Edinburgh, in spite of improvements in diagnosis and treatment and a multiplication of the smaller hospitals capable of dealing with these catastrophes, reasonably argues that the total incidence of the disease is rising. At Guy's Hospital the same thing is to be observed. Dividing the period 1910–29 into four five-year periods the admission-rates for perforated duodenal ulcer are as follows:—

1910–1914	.. .. ..	48 cases
1915–1919	(war period) ..	29 ,,
1920–1924	.. .. ..	87 ,,
1925–1929	.. .. ..	115 ,,

A part of this increase may be due to the fact that surgeons have come to observe a better precision in locating ulcers with reference to the pyloric sphincter. The annual total of deaths from duodenal ulcer in England and Wales has almost doubled in the last decade (see below). It seems doubtful whether this increase can be wholly accounted for by such factors as growth of population, improved recognition, and better habits of precision in recording the site of the ulcer. Moreover, the deaths from gastric ulcer have shown a contemporary and parallel rise. In both cases the increase is much more conspicuous in the males.

2. Although the mortality of its most serious complication has been remarkably diminished by surgery duodenal ulcer continues to take its toll and remains, through painful dyspepsia and occasional hæmorrhage, a serious cause of disability and lost efficiency among members and classes of the community often endowed with energy and usefulness above the average and sometimes with outstanding ability.

3. Although of all the dyspeptic disorders duodenal ulcer presents the most clear-cut clinical picture, its leading characters and natural behaviour are not so widely appreciated in the profession as they might be.

Thus the length of time elapsing between first appearance of symptoms and diagnosis is usually to be reckoned in years rather than months. As the prospects of sound healing with a medical régime are best in the early days and diminish with the passage of time (vide Nielsen,[2] whose figures support the common experience of physicians), the prompt recognition of symptoms is an essential contribution to therapeutics. Except in the case of doctors or medical students, I rarely see a case with a history of only weeks or months. Among 184 cases of duodenal ulcer referred to me in which the length of history is recorded, there were only 52 in which this was two years or less. I have notes of 48 cases with histories of ten years and upwards, and of these 17 gave histories of 20 years or more, and a further five had had symptoms for at least 30 years. Among 121 cases (excluding cases of pyloric stenosis) in which the length of time between first symptoms and diagnosis could be roughly computed (all cases diagnosed in less than one year being counted as "immediate") *the average interval was seven years.*

4. Duodenal ulcer has supplied us with a number of problems in ætiology, prognosis, and treatment which are at present only partially solved.

Doubts and difficulties continue to confront us. The wavering from medical to surgical and back to medical opinion and the continued invention of new treatments and operations are eloquent of our uncertainty. Extravagant claims have been made from time to time by protagonists of both the medical and surgical schools. Bacteriology, biochemistry, minute anatomy, and statistical inquiry have, severally and collectively, failed to give the whole answer to our question. We have reached a point at which therapeutic experiment and specialised studies seem no more competent to give help in practice than a general survey of the active disease as it occurs and as it varies in living man.

To achieve such a survey with any completeness and within the compass of a single lecture would be an impossible task. I must therefore content myself with a condensation of experience and must ask to be excused lengthy references to the literature. All that is best of our knowledge of the subject is to be found in Moynihan's "Duodenal Ulcer" and in "Gastric and Duodenal Ulcer" by Hurst and Stewart. To the authors of these classics we must always remain indebted. If my remarks provide some small stimulus to the further pursuit of the old observational method (and without the coöperation of this method experimental medicine can make but a halting advance), and if, in addition, I can adduce reasons for the adoption of a more judicial attitude in arranging the treatment of cases, I shall be well satisfied.

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* Hunterian lecture delivered before the Royal College of Surgeons of England on Feb. 8th.

I have among my files the notes of upwards of 350 cases interrogated and examined by myself to which the diagnosis of duodenal ulcer is attached. From these I have separated for analysis only those in which the clinical story was confirmed by operation, hæmorrhage (generally melæna), or a reliable radiologist. This series comprises (*a*) 218 cases, of which 24 had proceeded to the development of pyloric stenosis. To these I have added (*b*) 35 cases of anastomotic ulcer, and (*c*) eight cases of other surgical disappointments following gastro-jejunostomy undertaken for the relief of a duodenal ulcer. My mental images are naturally coloured by an equivalent experience of hospital patients drawn from other sections of the community, but I have preferred to employ the material immediately to my hand and upon which all observations were intimate and personal.

The Origins of Duodenal Ulcer.

CONSTITUTION.

Wherein should we seek the beginnings of a disease which tends strongly to relapse or chronicity and which has no basis in contagion or epidemic causes? Clearly, I think, in the peculiarities and antecedents of its victims or in their habits and environment. Preoccupied with the lesion and with hypotheses as to its mode of initiation and perpetuation by local bacterial and chemical action we have too long delayed our study of the soil in which it thrives. We have but to observe in sufficient number our patients as they come before us to appreciate that we are here confronted with distinctive human types or constitutions. Within these constitutions we may already discern certain physical, biochemical, and psychological variants which between them supply what we may call the "ulcer diathesis." Thus, if our notes are sufficiently descriptive, we find again and again that our patients are delineated as "lean and nervous" men, often tense and muscular and with brisk mental and physical reactions, or, alternatively, as robust and energetic and, when free from symptoms, of strikingly healthy appearance. There are even physiognomical characters which may impel us to hazard the diagnosis before the history is taken, but, as the disease itself may put a stamp upon the features, we cannot here be sure that we are concerned with heritable variations. The epigastric angle is commonly wide, and the observations of Faber[3] have enabled us to correlate this feature with the short, high, "steerhorn" stomach of the radiologist. Moody, Van Nuys, and Chamberlain[4] find this type of stomach more common in the male sex. Campbell and Conybeare[5] have also associated this type of stomach with broad athletic men on the one hand and with hyperchlorhydria on the other. Izod Bennett[6] and I earlier reported hyperchlorhydric curves in 8 per cent. of healthy male students. Psychologically these folk are energetic, restless, conscientious, intent on their projects, and not seldom given to anxiety of mind. If engaged in business their city lunch is an occasion not for respite and digestion, but for more business. Recognition of these facts is essential to a proper understanding of the disease and to the handling of cases. No disease, however, should be summarily ascribed in any part to constitutional causes unless we can also demonstrate that it exhibits a familial tendency. Other chronic maladies like gout, asthma, and epilepsy have long been accepted as having some basis in constitutional causes and provide positive family histories in approximately 25 per cent. of cases. Occasional reports on the familial tendency of ulcer had appeared previously, but it was not until 1921 that Hurst,[7, 8] who is so largely responsible for our reawakened interest in the constitutional factor, laid emphasis upon the real importance of inheritance in this disease. In his paper bearing on the subject he quoted among others three family histories which had then come to my notice, including one in which three brothers were operated on for duodenal ulcer and a sister for gastric ulcer. In my present series (*a*) there were 23 instances (10 per cent.) in which a near relative—i.e., parent, child, brother, sister, aunt, uncle, or first cousin—was recorded as having had a duodenal ulcer. In one instance the father of the patient, two uncles, and one cousin, and in another a sister and two maternal cousins had been afflicted. Histories of "dyspepsia" in near relatives are also common. If allowance be made for the infrequent recognition of duodenal ulcer as a cause of dyspepsia in the last and preceding generations, the frequency with which the diagnosis is missed at the present day, the customary inattention to the family history of a disease until its importance becomes widely accepted, and the difficulty always experienced in collecting and recording medical pedigrees, it seems probable that the actual incidence of positive family histories in duodenal ulcer would prove to be higher than these figures indicate.

SEX, AGE, AND OCCUPATION.

Sex.—The well-recognised preponderance of male over female cases (four to one in the present series) must also have some bearing on ætiology. The broad epigastric angle and steerhorn stomach are commoner in the male sex. The male of the type described spends his energies freely, often bolts or misses meals, often smokes excessively, and generally lacks the aptitude or opportunity for quiet in his life which falls more frequently to the lot of womankind.

Age.—The age-incidence of the disease is also instructive. Roughly half the cases are between the ages of 30 and 50, that is to say, within the period of life when work and worry most predominate. Duodenal ulcer is rare in childhood and, in fact, until after puberty, although occasional boyhood cases are to be found in any long series. It is rare for symptoms to make their first appearance after the sixth decade, although recurrences then and even into the seventies and eighties are not infrequent. The average age in my series at the time of consultation (excluding cases of pyloric stenosis) was 47 years. The youngest patient was aged 19, the oldest 83. The youngest calculated age of onset was 9 years, and there were others as young as 12 and 15. Positive family histories, as we should anticipate, appear to be more frequent in the youthful group.

Occupation.—The influence of occupation is hard to assess. No figures, for instance, are available for comparing the incidence of the disease in urban and agricultural communities. On a retrospect of experience it is difficult to avoid the conclusion that the life and occupations of the city are rather more productive of the disease. Among 94 cases in which the profession is recorded I find 28 doctors, 22 business men and lawyers, 13 officers of the Army, Navy, and

Air Force, 7 dentists, and 24 in other walks of professional life. Doctors and members of the fighting forces also appear to show a special liability according to Hurst's figures from New Lodge Clinic.[8] The missed and bolted meals, and the cares which come to interrupt the smooth course of his digestion, might well be advanced in part explanation of the medical man's apparent predisposition to the disease. Its occurrence in the Services is merely a reminder that the disease is one of robust or active rather than frail or indolent constitutions. Lord Moynihan[9] has recently referred to his experience of cases in athletes of the first rank.

OTHER ÆTIOLOGICAL FACTORS.

Tobacco.—Smoking had been indulged in by the men almost invariably and sometimes in great excess, but, although medical and surgical opinion unite in opposing the free use of tobacco by ulcer victims, and many patients appreciate that they are better without it, or even that it may aggravate symptoms, it is difficult to obtain concise proofs with regard to the part which this habit plays in determining the arrival or perpetuation of symptoms or the different incidence of duodenal ulcer in the two sexes.

Focal Sepsis.—Although it is a reasonable part of treatment to eradicate focal sepsis, and although the teeth or the appendix can often be shown to be unhealthy, the actual contribution of cryptic infections is still difficult to assess. Dental, tonsillar, and sinus infections are not necessarily followed by duodenal ulceration, even in persons predisposed by constitution or habits of life. Furthermore, duodenal ulcer may develop in patients in whom no focus can be found or who have long since been deprived of their teeth or vermiform appendix.

Environment.—I have referred to the possibility of a higher incidence of duodenal ulcer under the conditions of life in cities. With others I have also been struck by the promptly beneficent influence of a healthy out-of-door life on the active symptoms of the disease. A country holiday will frequently cut short an attack. Nervous influences play their part, for pain may cease on the first day of the holiday. One patient of mine could spend weeks ski-ing in the Austrian Alps, living on black bread and beer, without symptoms, but would relapse in his English home where his diet was carefully arranged. But more impressive than such isolated cases has been the story, repeated to me on several occasions, that men with duodenal ulcer, who were dyspeptics before their military service and again on their return to office life, were entirely free from symptoms under the hard physical conditions of active service abroad during the war.

Climate may also play some part. I have had patients who were free from symptoms in India but afflicted when at home, and Major E. B. Marsh, who made a particular study of duodenal ulcer among the troops at Aldershot, where he found it prevalent, later wrote to me from India to report that in 22 months in the East among British troops, differing only in that they were slightly older than the home troops, he had not seen a single proven case of ulcer.

Season, as Moynihan[10] showed long since, undoubtedly influences the fluctuations of the disease in the individual, winter, or autumn and spring recurrences being commonly described. Recurrences at these seasons or "in cold weather" were specifically entered in my notes in 25 cases (12 per cent.) of the duodenal ulcer series (*a*). Raw east winds are particularly obnoxious to sufferers from duodenal ulcer. Seasonal infections may be a factor, but the majority of patients do not remark on this association.

Mental States.—A restless stomach accompanies a restless mind. In many cases anxiety and mental conflict seem to play a part in the aggravation of symptoms. In a minority of cases (although it be beyond proof) it is tempting to wonder whether the disease would have developed in the absence of psychological turmoil.

Ætiological studies are thus shown to be of some importance, and if we can cast our vision forwards to a time in which we shall be more concerned with the prevention than with the cure of chronic diseases of this class it is clear that our method will find its basis quite as much in intimate studies of constitution, habits of life and environment, as in the refinements of chemistry, bacteriology, and animal experiment. In our choice of treatment of the active disease we must also remain attentive to these elements in its natural history, remembering that the success of therapeutic experiment in the long run depends even more upon knowledge and judgment than upon technique.

The Course of Duodenal Ulcer.

I have referred to the long interval which commonly elapses between first symptoms and diagnosis. The chief reason for this is to be found in the natural tendency to spontaneous remissions of symptoms. Patients and doctors alike in the first attack, delighted by the quick response to dietary care or "a bottle of bismuth," with disappearance of all pain within a period of two or three weeks or less, are lulled into an attitude of false security and deem the "bout of indigestion" past and done with. As Moynihan and others have clearly proclaimed, this behaviour is characteristic of the disease. If we are to judge by the early clinical course of duodenal ulcer (for symptoms surely bear some relationship to "activity") there must be repeated attempts at natural healing, and this is a particular justification for medical measures at this stage. That spontaneous healing occurs is evident from the scars found in the course of routine post-mortem work. The first attacks may last no more than ten days and rarely more than three or four weeks, and they may be followed by free intervals of enjoyable health, with ability to eat all foods, enduring for six months or longer. The man who starts his illness with a melæna is really a lucky man, for by this means his diagnosis is declared and early and strict treatment instituted. Many patients go free all the summer months and suffer relapses between October and March. With the passage of years the bouts of dyspepsia become more prolonged and frequent. And so the disease may drag on intermittently for five, ten, or even twenty years, with or without distinctive complications and often, in the latter event, without a diagnosis.

Hæmorrhage occurred at one stage or another in rather less than 40 per cent. of this series (*a*), but it should be recalled that many cases unconfirmed by operation, X rays, or hæmorrhage were excluded, so that the figure is clearly too high. Most authors of experience record hæmorrhage as occurring in approximately 25 per cent. of cases. Allowing for the many "missed" dyspeptic cases, all recorded percentage figures for the complications must be accepted as too liberal. Perforation (including "local perforations") occurred in ten cases of the duodenal ulcer series (*a*) and in the anastomotic ulcer series (*b*) (35 cases) in seven cases before and three after operation. These figures give no indication of the actual frequency of perforation. The physician is rarely called to these emergencies. It is, however, a much rarer complication than hæmorrhage. Pyloric stenosis occurred in 24 (11 per cent.) of my cases series (*a*). The serious complication of involvement of the head of the pancreas, with its particular syndrome (to be described later) occurred in 2 per cent. of this series.

Mortality of Duodenal Ulcer.

It is impossible to estimate the death-rate of a disease so widespread and yet so ill-recorded as duodenal ulcer. Even allowing that the majority of deaths among patients of the hospital class occur in hospital we can obtain no accurate measure, for hospitals not only attract the cases of perforation and hæmorrhage in undue proportion, but also admit only the more serious of the dyspeptic cases. In 20 years at Guy's Hospital there have been 153 deaths among cases of duodenal ulcer. Of these, 70 followed perforation, 25 followed hæmorrhage, and the remainder were indexed as due to various secondary complications of perforation or of operation undertaken for the relief of the disease or of its complications, or to intercurrent disease. That is to say, in a hospital admitting about 100 cases a year, about seven or eight cases a year die from all causes. For every one of these 100 cases admitted to the wards there must be several others from the same communities treated as out-patients and in their homes, or remaining undiagnosed and untreated. In general, although its interruptions to health are numerous, the menace to life of a duodenal ulcer is not a very grave one. According to the Registrar-General's returns there were 1140 deaths (male) and 160 deaths (female) from duodenal ulcer in England and Wales during 1930, as compared with 552 (male) and 129 (female) in 1920. These figures are sufficiently arresting, and yet they must represent but a small percentage of the total army of recognised and unrecognised cases.

The Symptoms of Duodenal Ulcer.

Moynihan[10] has rightly insisted on the anamnesis as the main plank in the diagnosis of duodenal ulcer. This should include all proper inquiries into personal and family history, environment, occupation, and habits, for these may serve not only to complete the opinion, but also to balance judgment in therapeutic decisions. But above all our interrogations must deal intimately with subjective phenomena. In the majority of cases it should be possible to arrive at a diagnosis of duodenal ulcer from the history and symptoms alone, and before the physical examination or accessory measures, such as radiology and the test-meal, have been called upon to play their part.

The leading symptom is the pain. It is true that an ulcer may be present to the tune of "wind" or "acid vomiting" and that the patient may deny the occurrence of true pain, but this is not usual. Employing a method of pain-analysis which I have advocated elsewhere we may consider the pain of duodenal ulcer under ten headings having reference to (1) character; (2) severity; (3) situation; (4) *localisation (or extent of diffusion); (5)* paths of reference; (6) duration; (7) frequency; (8) special times of arrival; (9) and (10) aggravating and relieving factors. The character of the pain is described with great consistency as "gnawing" or, alternatively, as "aching" or "like a toothache." There is no intermission, although there may be slight fluctuations while it lasts. It is "wearing" and "worrying" but not so severe, as a rule, as to prohibit work, although it may hamper efficiency and concentration. With the occasional complication of pancreatic erosion it may, however, become very severe and even require morphine for its relief. Its situation is indicated by the patient with the finger-tips in mid-epigastrium or slightly to the right in more chronic cases; it is then generally at a lower level than that indicated by the right subcostal gesture of cholecystitis. It has a precise position and localisation, but in severe, old-standing cases, and especially when flatulence with ærophagy is pronounced, it may "spread" widely into the chest. When the pancreas is involved it "goes through" to the back at the same level and, occupying the region of the twelfth rib (appreciably lower than the subscapular reference of gall-bladder disease), it may even create a suspicion of a right renal lesion. In these cases, too, the anterior pain may be "right subcostal" rather than "epigastric." The pain is absent on waking, and remains in abeyance until some two to two and a half hours after breakfast. Arriving, let us say, at 11.30 A.M. it will persist for an hour or more or until relieved by lunch, but it may return again before tea and agai in the evening. Rearrangements of diet or meal will modify the behaviour of the pain. In cases o long standing a special time of occurrence is 2 A.M. when it wakes from sleep and lingers for an hour o two unless assuaged by food, a warm drink, or medicine It is aggravated by fasting, worry, fatigue, and cold and sometimes by smoking. It is relieved by food drink, warmth, rest, peace of mind, and alkali Delayed pain, first noted in 1828 by Abercrombie, and the hunger-pain with relief by food so clearl portrayed by Moynihan (although they are occasionall due to other causes—i.e., gall-stones, appendiciti gastric ulcer, worry, tobacco-excess, and very rarel carcinoma of the stomach) are thus the outstandin features of the disease.

We must not, however, neglect associated symptom With or without the pain an epigastric "sinkin sensation," which probably represents an exagger tion of the normal gastric phenomena of hunge is often mentioned. It is rare in other dyspepsia Feelings of "flatulence" or of fullness or a "burstin sensation" may accompany or replace the pai In all cases of dyspepsia with pronounced flatulen the time of arrival of the symptom should determined. If this is before meals and food giv ease the possibility of duodenal ulcer (even in th absence of pain) must be seriously considered. Th relief by eructation, and especially that which follow the use of bicarbonate of soda, suggests to the patien and often to his doctor, that the case is "merely o of flatulent dyspepsia," but flatulent dyspepsia mu have a cause, and when the flatulence is rhythmic and at its worst before meals this cause is ofte duodenal ulcer. The gas eructated is odourle except in the presence of pyloric stenosis when may have the taint of sulphuretted hydrogen. Vomi ing has been regarded as a rare symptom in duoden ulcer without stenosis, but this requires qualificatio Vomiting of food is, indeed, exceptional, but an acid watery vomit is common especially with the more chronic ulcers. If later the quantity of this watery vomit increases or *food is mingled with it* cicatricial stenosis should be suspected. Acid eructations which burn the throat and roughen the teeth are the only symptom, in my belief, of hyperchlorhydria and so may occur with duodenal ulcer, but they are not usual. Waterbrash, or the sudden filling of the mouth with tasteless watery saliva, sometimes with accompanying pain in the parotid glands, is more common and so characteristic of duodenal ulcer and so rare in other dyspepsias that it has genuine diagnostic value. One patient spontaneously and aptly described this symptom to me as "a beautiful action of Nature."

Waking, he said, at night with bad pain he would shortly find his mouth filling with water as fast as he could swallow it; as he did so the pain steadily faded away. Heartburn and nausea are not symptomatic of duodenal ulcer. Constipation, especially during the attacks, is a frequent complaint.

Apart from the local symptoms of the disease there are certain general complaints which are very real to the patient and sufficiently rare in other gastric disorders to be of definitive value. I would particularly mention a feeling of physical weakness or exhaustion which is coincidental with the pain and akin to feelings experienced in association with rectal spasm, excessive purgation, or other strong visceral crises. Mental irritability and loss of the power of concentration are also described and are evidence of the powerful nervous influences attendant on a visceral disturbance which carries with it, as well as pain, the psychic and physical phenomena of strong hunger. These symptoms also are relieved by food.

FACTORS WHICH INFLUENCE SEVERITY, CHARACTER, SITUATION OR FOOD RELATIONSHIPS OF THE PAIN.

It should be mentioned, for it is not as widely appreciated as it might be, that the degrees of physical disturbance in duodenal ulcer show wide variations. The physician sees many cases in which the very mildness of the symptoms has led to a postponement of diagnosis. The surgeon, no doubt, sees a higher proportion in which pain is outstanding and severe. The severity of the pain tends to increase with the chronicity of the ulcer. It increases at first with commencing stenosis, but later, as gastric dilatation supervenes upon hypertrophy, pain becomes less obtrusive and vomiting is the leading symptom. When the head of the pancreas is eroded by a posterior ulcer the pain is at times unbearably severe and in the presence of this complication I have seen courageous men reduced to exhaustion and tears. Apart from hæmorrhage it is the only symptom which the physician may be called upon to treat with morphine. It is worthy of note that hæmorrhage may immediately abolish pain. When bleeding is severe, confinement to bed, morphine, and abstention from food and later a strict dietary clearly explain the relief, but even slight and at first unrecognised bleeding with an ambulatory case will have the same effect. In this circumstance a patient who has been suffering dyspeptic pains may actually hold himself better as regards his ulcer and a failure to appreciate the significance of developing weakness and anæmia results. In the presence of early stenosis pain may become more "grinding" or "peristaltic" in quality. The situation of the pain commonly shifts to the right in the case of old-standing and adherent ulcers. The interval between food and pain diminishes in the early stages of pyloric stenosis and may be reduced to one or one and a half instead of the two or three hours previously experienced. It should also, however, be recognised that patients with extreme gastric "hurry" occasionally show a very short food-pain interval. With ulceration involving the head of the pancreas all clear relationship to food tends to disappear and alkalis may cease to be effective.

Objective Signs.

In the absence of pyloric stenosis with gastric dilatation or the rare discovery of a palpable inflammatory tumour it is too widely assumed that duodenal ulcer is a disease without physical signs. If carefully sought for, superficial, or more commonly deep cutaneous soreness, an increased abdominal reflex, muscular guarding, and deep tenderness—all confined to the right upper quadrant of the abdomen—will be found either singly or in various combination in a high proportion of cases. These signs are more likely to be found with anterior ulcers, during stages of activity, and when pain is actually present. They disappear with healing. An increased reflex and muscular guarding are both more common than cutaneous hyperalgesia. Very occasionally a pilomotor reflex (goose-skin) confined to the same area may be observed when eliciting the abdominal reflex. The vasomotor consequences of active pain are sometimes manifest in the facies. Thus near relatives describe pallor or "greyness" coincident with suffering in chronic cases. Phosphaturia is so common in association with active duodenal ulcer that I have come to expect a milky urine at the time of consultation in the majority of cases. How far it is related to the taking of alkalis or not I have been unable to determine. Loss of weight is seldom conspicuous in uncomplicated cases.

Complications and Sequelæ.

Hæmorrhage and perforation, cicatricial stenosis and anchorage of the ulcer-base to the head of the pancreas are the important complications. To these we must add the unsuccessful gastro-jejunostomy which, under modern conditions, has been a sufficiently frequent sequel to justify its inclusion in a study of the natural history of duodenal ulcer, and, in a retrospective way, may even help to illuminate the disease.

With the symptoms of hæmorrhage and perforation I shall not especially concern myself for they are well known. Hæmorrhage, as stated, occurs in about one-quarter of the recognised cases. In many of my cases there was a history of two or more hæmorrhages; 107 patients (series *a* and *b*) between them had 151 hæmorrhages. Two patients, aged 76 and 56, died of gastric uræmia (alkalosis) with coincident hæmorrhage, in one case following an operation. One, aged 56, died of coincident hæmorrhage and cellulitis of the arm. One, aged 36, was transfused on account of a severe hæmorrhage from a chronic ulcer, had an immediate reaction and succumbed. Three cases, aged 76, 72, and 26, died of hæmorrhage alone. The older the patient, the longer the history and the more severe the tale of dyspeptic symptoms, the more seriously should an hæmorrhage be regarded, for the more likely in this event is it that the ulcer is deep and that a large vessel is eroded. In the case of bleeding with slight or recent dyspeptic symptoms or without previous dyspepsia and in young subjects, the prognosis can usually be reassuring. In my solitary fatal case in a young man there was a long history of very severe pain with a posterior reference which had led me, a few days earlier, to a diagnosis of pancreatic erosion. The total mortality from hæmorrhage is small. There were 25 deaths from this cause during 20 years at Guy's Hospital as compared with 128 deaths from other causes. The association of pyrexia with recent hæmorrhage is worthy of mention. As Hurst[8] concludes it is probably due to retention of blood in the bowel, for it subsides when the bowel is clear. In one case of mine, a severe hæmorrhage occurred but without hæmatemesis or melæna. The bowels did not move for several days and the combination of high fever and acute anæmia had, not unnaturally, caused doubts as to the correct opinion.

As indicated no idea of the incidence of perforation can be obtained from this series. There were 10 cases (series *a*), including cases of local perforation which did not lead to immediate operation. Approximately one-fifth of the cases of duodenal ulcer admitted to Guy's Hospital are for a perforation, but clearly this is the complication above all others which necessitates institutional treatment. The likelihood of perforation is greatest in the early stages of the disease and diminishes with the passage of time.

The classical symptoms of established pyloric stenosis (which is generally a sequel of duodenal rather than prepyloric ulceration) include voluminous vomiting of food taken many hours, or even days previously and loss of weight. The late physical signs include a visible stomach "standing out" on the abdominal wall, visible peristaltic movements from left to right and succession splash at a time when the stomach should be empty. It should, however, be possible to diagnose the condition before such striking symptoms and signs appear and chiefly from the past history and an alteration in the time and character of the pain and palpability of the hypertrophied organ. Eructations of sulphuretted hydrogen have been regarded as especially significant of obstruction by a pyloric carcinoma, but I have recorded them more frequently in benign stenosis. They are not necessarily a late manifestation. They were mentioned in eight of my 24 cases. If eggs and protein foods have been excluded from the diet they do not occur.

There is an important, if occasional, syndrome of pyloric stenosis in which general symptoms predominate. This has been described as "gastric uræmia." There were three examples among my 24 cases. The symptoms include drowsiness and irritability or stupor often leading to a fatal coma and are held to be due to an alkalosis such as occurs with the vomiting of high intestinal obstruction or excessive dosage of alkalis. The blood-urea is raised, sometimes markedly so. Vomiting need not necessarily be excessive. Operative risk is increased, and yet if the condition is recognised in time a short-circuit after suitable preparation (including routine lavage) is indicated. Every case of pyloric stenosis should have a blood-urea estimation prior to operation as the operation and anæsthetic may precipitate the symptoms. Treatment with alkalis is contra-indicated in the presence of organic stenosis and renal deficiency. There were no cases of tetany in this series. I have encountered altogether five cases of "gastric uræmia" complicating duodenal or pre-pyloric ulceration. Four ended fatally, and in two the diagnosis was only made at necropsy. The third patient, an elderly subject, who had previously undergone prostatectomy, was also bleeding and was too ill to warrant operation. The fourth was noticed to be mentally peculiar before an operation undertaken for pyloric stenosis and was anæmic from slight hæmorrhage; the true cause of the mental change was overlooked, he became comatose and died shortly after the operation. The fifth case showed no symptoms until after the operation but recovered.

A case of pyloric stenosis with "gastric uræmia" (alkalosis).—A man, aged 51 (sent by Dr. Bernard Haigh), had had "stomach trouble" all his life and was treated medically for duodenal ulcer 20 years previously. Eight years previously he was operated on for a perforated duodenal ulcer, but had never been really well since. He complained of hunger-pain, but had also started voluminous vomiting of acid-fluid with a little food. I noted visible peristalsis. His blood pressure was 200/120; the urine occasionally contained a trace of albumin. After confirmation of the diagnosis in hospital a gastro-jejunostomy was performed by Mr. P. Turner. Almost immediately after the operation he became restless, mentally deranged, and then stuporose. His blood-urea figure was 112 mg. per 100 c.cm., or nearly four times normal. He was treated with sedatives and rectal salines and made a complete recovery.

The average duration of ulcer symptoms in 16 of my cases of pyloric stenosis was 17 years. Only two cases gave histories of five years or less.

INVOLVEMENT OF THE PANCREAS.

The duodenum is doubtless anchored to the pancreas by adhesions in many cases of posterior ulcer. In a small number the base of the ulcer may become more firmly welded to this organ or may actually erode it. In this event a clinical syndrome develops which is characterised by pain of unusual severity, not responding to strict medical treatment and alkalis, and even requiring morphine for its relief. The pain is commonly in the right upper quadrant and referred through to the right loin and may be chiefly felt posteriorly. Biliary and renal calculus are therefore sometimes wrongly diagnosed. Glycosuria occurs in some cases, and I have seen it come and go with the ulcer symptoms. The diagnosis is occasionally missed by expert radiologists in these cases, partly, I believe, because, with firm fixation of the duodenum, the prepyloric antrum is thrust over to the right during peristaltic activity, and so obscures the first part of the duodenum altogether. I have also seen cases in which a posterior adherent duodenal ulcer had escaped detection at operations undertaken for the relief of an ulcer or with a view to discovering the cause of pain.

A case of posterior duodenal ulcer involving the pancreas.—Major A., a fine old soldier, aged 73, suffered for many year from periodic bouts of dyspepsia with pain arriving som hours after food and relieved by it. Later the pain becam greatly intensified and less clearly related to meals. H saw a surgeon who *diagnosed gall-stones and*, in spite of negative cholecystography, operated for gall-stones. Find ing no stones he drained the gall-bladder. Durin convalescence there was melæna on two occasions. Th pain continued as before, and in his worst attacks, whic took place at night, was sometimes so severe as to make hi weep; it was accompanied by involuntary tremors an *shivering. I saw him in pain and it* was a pitiful spectacl The pain was referred to the level of the eleventh an twelfth ribs on the right side posteriorly and there wa guarding with tenderness over the right upper rectus. diagnosed "posterior duodenal ulcer involving the pancreas. The radiologist reported "appearances strongly indicati of an ulcer of the stomach about half-way between th cardia and the pylorus." Mr. L. Bromley operated an found no gastric lesion but a posterior duodenal ulcer firml welded to the head of the pancreas. A gastro-jejunostom was performed and all symptoms were completely relieve

ANASTOMOTIC ULCER.

For every ten cases of duodenal ulcer referred me I see one case of anastomotic ulcer. This gives indication of the frequency of this sequel, for it evident that surgical "failures" find their way the physician just as medical "failures" find the way to the surgeon. The sequel, however, is serious one and sufficiently common to justify caref inquiry into its causes and the greatest caution in t selection of cases for a gastro-jejunostomy.

The development of ulceration at or near the ston has been variously attributed to faulty techniqu unabsorbable sutures, the failure to eradicate foc sepsis, and neglect of appropriate after-care. My ow experience suggests that more important than a of these are a faulty judgment in the selection of cas for operation and the presence of a strong constit tional predisposition. There was a positive fami history in seven out of my 35 cases of anastomot ulcer (*b*), twice the rate of incidence in the duoden ulcer series (*a*). The age at onset of the ulcer-sym toms for which the operation was undertaken w under 20 years in six cases and in three of these the was a positive family history. Early appearance a chronic disease more usual in later decades shou always suggest constitutional predisposition. I ha notes of two cases of anastomotic ulcer in which had myself advised the short-circuit. In the fir the patient's father had had ulcer symptoms, althou ulcer was never definitely diagnosed, and the patient himself started life with congenital pyloric stenosis. The second patient was a highly nervous and restless man, continually preoccupied with financial cares. His symptoms had recurred in spite of strict medical treatment. He developed vicious cycle vomiting soon after the operation together with signs of a local peritonitis. Unsuitable temperament and technical flaw here conspired to bring about the bad result.

In 12 cases the symptoms of duodenal ulcer had been present for only a year or less before the operation, and in four others for two or three years only. In six cases there had been symptoms for ten years or more. The remainder were of intermediate or indeterminate duration. It is difficult to avoid the impression (which these records and my hospital experience support) that short-circuits in the case of young persons and short histories are unsound. It is clear enough that the conditions in either case are remotely removed from those which originally justified the operation—namely, an established obstructive lesion.

In 12 cases of anastomotic ulcer there was a history of hæmorrhage prior to the operation and in nine of these the operation was apparently undertaken largely on account of this symptom. Of the 12 cases which had bled before operation eight bled again after it. Of 23 cases which had not bled before operation ten bled subsequently. On the experience of these cases and hospital work I incline to the view that hæmorrhage should not be regarded in itself as an indication for gastro-jejunostomy. Seven cases of anastomotic ulcer gave a history of perforation before operation. Three of these perforated again afterwards.

Recurrence of ulcer symptoms was noted in a year or less in 19 cases; in two years in 2 cases; in three years in 3 cases; in four years in 1 case; in five years in 2 cases; in six years in 1 case; in seven years in 1 case; in nine years in 2 cases. In four cases the interval was not recorded.

The symptoms of anastomotic ulcer are very similar to those of the original duodenal ulcer. There is hunger-pain with more or less relief by food. Both immediate and lasting relief of symptoms, however, even with the strictest medical care, is much less certainly attained than in the case of duodenal ulcer. Furthermore, pain and distress tend to be more severe and lasting. Hæmorrhage may occur without premonitory pain. The most constant physical sign is a point of tenderness just above and to the left of the navel. Anastomotic ulcers are liable to the same leading complications as duodenal ulcer—namely, hæmorrhage, perforation, and stenosis. The most wretched and often fatal complication is a gastro-jejuno-colic fistula of which the symptoms are pain, eructation of "bowel-wind," or even vomiting of fæces, diarrhœa, anæmia, and emaciation. Fortunately it is rare. I have had two cases under my care in hospital but none in private practice. Hamilton Fairley and Kilner have recently reported on cases showing fatty diarrhœa with a megalocytic anæmia.[12]

OTHER COMPLICATIONS OF THE SHORT-CIRCUIT.

The most important remaining complication is "vicious cycle vomiting," which is characterised by attacks of copious bilious vomiting at irregular intervals with or without pain. The "dumping stoma," in which the common complaint is of a fullness and discomfort around and below the navel developing soon after meals and due to rapid over-filling of the small gut, is inconvenient but less crippling.

THE PROSPECTS OF OTHER OPERATIONS AND MEDICAL TREATMENT.

It is too early to assess the later results of alternative operations such as gastro-duodenostomy, resection, and excision. Only after some 20 years are we learning to view in correct perspective the advantages and disadvantages of gastro-jejunostomy, and if we are wise we shall not too trustfully accept the promises made on behalf of the newer experiments. That they do not always succeed is already apparent. That they will often fail in the presence of strong constitutional predisposition or with *injudicious* selection of cases seems to me probable. Medical treatment carried out for a sufficient length of time, at rest and in accordance with physiological principles and with proper control and careful subsequent "handling," remains our only alternative. Here the best results are naturally obtained with early cases, and the onus lies upon those first responsible for diagnosis. With ulcers of long standing there is often grateful relief, but there are limits to lasting success, extravagant claims are not justified, and the same judicial care must be employed in the selection of cases. But, whereas a surgical failure often leaves the patient in far worse plight than before, the same cannot be said of medical failures. Surgical treatment has been claimed as an insurance against grave complications, such as perforation and hæmorrhage, but the study of post-operative histories shows this insurance to be of limited reliability.

Conclusion.

The naturalist customarily pursues his task for his own instruction and intellectual pleasure and with a view to enlarging the general stores of knowledge. The physician, as naturalist, is actuated by the same motives and, in addition, by the desire to improve treatment for humane ends. It is necessary, therefore, in stating my conclusions, to indicate anything of practical utility which may be held to emerge from a review of the natural history of duodenal ulcer in all its stages. What we chiefly need in practice to-day is some surer guidance in the grouping and management of cases. My present policy, based on experience, of which I have here given a partial account, is to advise gastro-jejunostomy in cases of pyloric stenosis; in cases of long-standing duodenal ulcer in which clinical history, X rays, and test-meal proclaim gross scarring or anchorage and a tendency to slow transit of food without serious stasis, and in which there has been recurrence in spite of one or more strict courses of medical treatment; in cases presenting the syndrome of anchorage to or erosion of the pancreas; and in cases of concomitant duodenal ulcer and duodenal ileus, where, again, there is an obstructive factor at work obviating sound healing by mechanical unrest and increasing the likelihood of perforation by increased intraduodenal pressure (as I have once successfully foretold).[13] My policy is to oppose surgical treatment in youthful cases; in non-obstructive cases with short histories and adverse pedigrees or not previously accorded a strict medical treatment; in cases with recent hæmorrhage, lacking other indications; and in cases in which X ray and test-meal show gastric "hurry," for here to accelerate emptying still further and to attempt an anastomosis in the presence of exaggerated motor and chemical unrest is to create just those conditions which may be held to favour secondary ulceration. Highly nervous individuals and elderly subjects should often be deemed unsuitable for surgery, even when the only alternative is continuous medical and dietary care. Economic and environmental factors must at times compel a modification of general policy. Surgical treatment should always be followed by a period of strict medical treatment and proper precautions thereafter. Psychological as well as physical requirements must be carefully studied.

All surgeons and physicians who undertake the treatment of this troublesome disease must endeavour to preserve the studious attitude, not lightly accepting opinion or submitting to the bias of their craft, and remembering always that they are not, in fact, concerned with duodenal ulcer the lesion, but with duodenal ulcer the disease, as it occurs and as it varies in individuals of special type and temper and differing daily circumstance. In each case, briefly, judgment must be based, not upon the presence of an ulcer, but upon a proper understanding of the whole patient and the whole disease.

As I have sought to show, duodenal ulcer has general effects on the body and the mind as well as general causes in them, and no effect or cause can be neglected.

In a restless and fretful age which has largely lost the old simplicities of diet and conduct the most important contribution which we can make to the prophylaxis of duodenal ulcer is to furnish, as opportunity arises, sensible instructions to the community (and particularly to such families or individuals as manifest a constitutional or occupational predisposition to the disease) with regard to the evils of missed and bolted meals, of excessive smoking, and of the prevalent habit of attempting to combine the process of digestion with anxiety and affairs. It is not extravagant to suppose that a cup of hot milk at 11 A.M. and bedtime would save many a harassed doctor or business man endowed with the diathesis from developing the disease.

The most important contribution which we can make to the therapeutics of duodenal ulcer is, by observing subjective symptoms, to ensure much earlier diagnosis, and, by observing the entire disease and the qualities of its victims, to achieve a wiser balance in our choice of method.

It is, I believe, a just criticism of surgery and medicine in the present era that they have concentrated on parts to the exclusion of the whole and on technique to the exclusion of philosophy. In duodenal ulcer no less than in many other maladies, we have come to rely upon too narrow a pathology. In our therapeutic quests we have been too little observant of physiological principle. We are all compelled by the magnitude of our subject to be something of specialists, but this should not necessitate an abandonment of that naturalistic outlook which marked the achievement of our old preceptors from Hippocrates to Hunter.

I am indebted to Mr. H. L. Eason, superintendent of Guy's Hospital, for access to the hospital records and to Mr. J. F. Mackridge for making the necessary extracts from these records.

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TWO CASES OF
LYMPHOGRANULOMATOSIS MALIGNA,
ONE WITH INVOLVEMENT OF THE VERTEBRAL PERIOSTEUM.

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With a commentary by

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CASE 1. *Lymphogranulomatosis maligna with extension to the spinal canal.*—The patient, a married woman aged 31, was in good health until 14 months before her death. Her illness began with "influenza," cough, and general pruritus, and she was admitted to Guy's Hospital, where glandular enlargement was found and a diagnosis of Hodgkin's disease with pulmonary tuberculosis was made. After six months the glands began to enlarge rapidly, and later she was admitted to the East Anglian Sanatorium, under the care of Dr. Jane Walker, and transferred to the Elizabeth Garrett Anderson Hospital, under D. C. H.

Past history.—She had noticed a small gland on the right side of the neck in 1926, but this had soon disappeared. She had probably contracted phthisis from her husband who died in 1925 of that disease.

Symptoms and clinical signs (September, 1930).—She complained chiefly of severe pains down the arms, and o pruritus; she became dyspnœic on slight exertion. The cervical glands formed a massive collar completely deforming the neck and extending downwards under the clavicles the axillary glands were enlarged, but no enlarged gland were detected elsewhere. A gland removed by biopsy showed typical lymphogranulomatosis maligna. The splee was not palpable and the liver not enlarged. There wa weakness and muscular wasting of the arms and hands the reflexes were retained, and there was no sensory change the lower limbs and sphincters were not affected. Ther was a paroxysmal cough and pain in the chest, the sputum contained tubercle bacilli, there was extensive dullness a both apices, and crepitations on the left side. There wa continuous, irregular swinging fever up to 101° F. Nothin abnormal was noted on examination of the other systems Radiographic examination showed enlargement of th intrathoracic glands with pressure on the trachea. Wassermann and sigma reactions were negative.

A *diagnosis* of lymphogranulomatosis maligna wit involvement of the vertebral periosteum was made b Dr. Parkes Weber, who saw the case in consultation.

Course of illness.—Treatment was given by X rays ove the right side of the neck with a view to relieving th pressure pains; no definite change in the glands was noted but the pain was distinctly lessened. The effect of th treatment on the lymphocyte count is shown in the Table The patient became gradually weaker and died on Dec. 1st 1930. Autopsy was performed on the same day.

Post-mortem report (E. H. L.).—Lymphatic glands an metastatic growths. Very numerous enlarged glands ar present on both sides of the neck and in the axillæ, th glands round the lower jaw are discrete, and shell out a the connective tissue is incised; those in the lower par of the neck are matted together and form dense masses the adjacent connective tissue is very œdematous. These glands have to be cut away from the periosteum, to which they are adherent on the anterior and lateral aspects of th lower cervical and upper dorsal vertebræ. In the second third, and fourth intercostal spaces on the right side ar small white nodules of growth lying beneath the pleura close to the spine. On the dorsal aspect of the thorax nodule of growth is present embedded in the muscle betwee the spine and the scapula; the nodule measures $1\frac{1}{2} \times \frac{3}{4} \times \frac{3}{4}$ in On removing the spinous processes a sheet of growth i exposed in the spinal canal, coming upwards on eac side of the dura and almost meeting in the mid-line on th

TABLE SHOWING BLOOD EXAMINATIONS (BY D. M. VAUX).

Date	Sept. 19.	—	Oct. 3.	Oct. 6.	Oct. 9.	Oct. 14.	—	Oct. 22.	Nov. 7.	Nov. 19.
Hæmoglobin percentage ..	48	X ray treatment twice weekly from Sept. 30.	—	—	—	—	X ray treatment stopped Oct. 17.	—	—	66
Colour index	0·54		—	—	—	—		—	—	0 56
Red cells per c.mm.	4,160,000		—	—	—	—		—	—	5,900,000
White cells „	18,800		24,500	36,000	28,200	26,100		22,800	24,300	19,400
Differential Counts.										
Polymorphonuclears per cent.	75 5		91	88·5	88 5	79		91·5	90	92
„ per c.mm.	11,100		22,295	31,860	24,597	20,619		20,862	21,850	17,848
Lymphocytes per cent... ..	22		6	4·5	5	8		3	3	3
„ per c.mm. ..	4,163		1,470	1,620	1,110	2,088		684	729	582
Hyalines per cent.	1·5		3	7	6	11		4·5	5	4·5
Eosinophils „	1		0	0	0 5	2		1	2	0·5

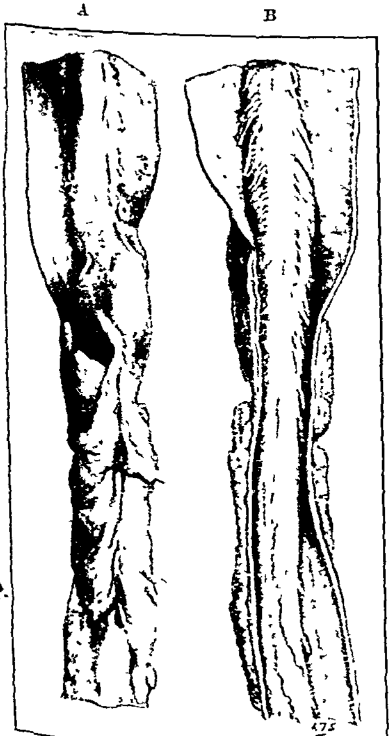
dorsal aspect of the cord. It extends for 5 inches from C. 7 above to D. 5 below. It is infiltrating the fatty tissue in the canal and the periosteum, and involves the bone in the region of the fourth and fifth dorsal spines; it extends round the anterior aspect of the canal and passes through the intervertebral foramina with the nerve roots; it is densely adherent to the periosteum. The cord is œdematous but firm. In the abdominal cavity the lymphatic glands are moderately enlarged; there is no extension of growth from the aortic glands to the periosteum of the spine.

The spleen weighs 10½ oz.; on section it shows several large, firm, yellowish-white nodules from 1 to 2 in. in diameter. The nodules are veined with brown pigment; the intervening tissue appears normal. Liver, kidneys, suprarenals, and pancreas appear normal. There is no enlargement of lymphoid follicles in the alimentary canal. The right pleural cavity contains two pints of muco-pus; there are extensive tuberculous lesions in both upper lobes; the glands are enlarged at both hila.

Histological appearances.—In the large glands the normal structure has entirely disappeared; there are thick strands of fibrous tissue enclosing islands composed of Sternberg cells, lymphocytes, polymorphonuclear and eosinophil leucocytes, and plasma cells; areas of necrosis are present. Localised nodules of typical lymphogranulomatous tissue are present in the spleen, the nodules are surrounded by fibrous tissue, in the outer layer of which is a deposit of brown pigment giving the Prussian-blue reaction; the splenic tissue between the nodules appears normal. A section from the posterior aspect of the dura where the growth is infiltrating the laminæ shows the typical appearances of lymphogranulomatosis. A section from the anterior aspect of the dura is composed almost entirely of small cells with round, deeply staining nuclei arranged in groups in a somewhat hyaline connective tissue stroma. A very few typical Sternberg cells can be found in some places, but plasma cells and polymorphonuclear cells are absent. The appearances resemble an endothelioma. A section of a nodule from an intercostal space, however, showed a combination of these appearances, so that a diagnosis of endothelioma could be excluded, and the common origin of the morbid process established.

The liver, kidneys, suprarenals, and pancreas show no changes.

FIG. 1 (Case 1).



Semi diagrammatic drawings of the upper part of the spinal cord, showing the lymphogranulomatous tissue lying *on the external* surface of the dura. A, anterior, and B posterior, aspect. (Drawings by W. Thornton Shiells.)

CASE 2. *Lymphogranulomatosis maligna with predominant lesions in the spleen and alimentary canal.*—The patient was a married woman, aged 48. She first attended the Elizabeth Garrett Anderson Hospital in 1923 for chronic indigestion, and two years later was admitted for a large hæmatemesis, from which she made a good recovery. Enlargement of lymphatic glands occurred in 1924 in the neighbourhood of the right parotid; these were removed in 1924 and again in 1925; there was no further recurrence in this situation; a small mass was removed from the left posterior triangle in 1929. No enlargement of glands in other situations and no enlargement of the spleen was reported at this time. In January, 1930, considerable splenic enlargement was present, but the general health was fairly good. In July she was admitted to the hospital. She complained of severe epigastric pain, aggravated by the taking of food; the tongue was sore.

Examination.—She was pale and thin, and the spleen formed a prominence on the left side of the abdomen, the lower pole being 1½ in. below the umbilicus; the liver was slightly enlarged. The glands were palpable in the neck, axillæ, and groins, but appeared to be normal. There was no pruritus. The heart, lungs, and nervous system were normal.

Special investigations.—A fractional test-meal on July 24th showed complete achlorhydria. A blood count on July 21st showed 40 per cent. hæmoglobin; a colour-index of 0·5; 4·65 million red cells; and 3500 white cells per c.mm. Another on August 25th showed hæmoglobin percentage of 60; a colour-index of 0·7; 4·98 million red cells; and 4400 white cells per c.mm. The differential white cell count was: polymorphonuclears, 77·5; lymphocytes, 9·5; hyalines, 8·5; eosinophils, 4·0; and basophils, 0·5 per cent. The red cell fragility was normal; the van den Bergh indirect reaction was positive; small amounts of urobilinogen were present in the urine. The Wassermann and sigma reactions were negative.

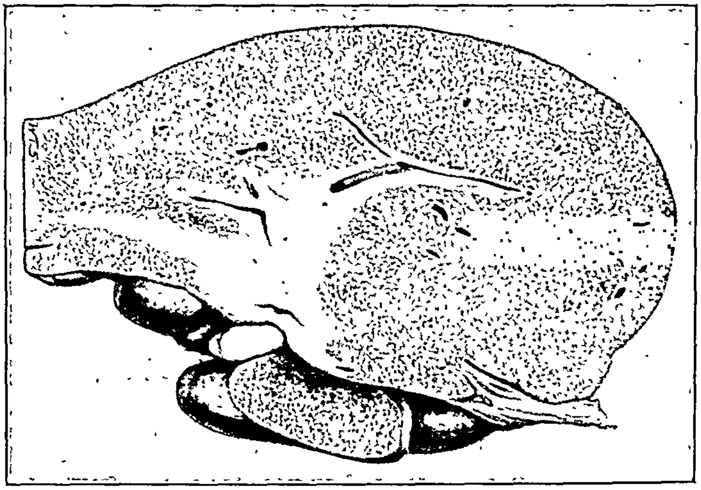
Histological examination of glands removed by operation in 1925 and 1929 (E. H. L.).—The largest and smallest glands all show the same appearances. No normal gland structure remains: it is replaced by small closely packed cells having round or oval nuclei. There is no evidence of active cell division. There is some increase in the endothelial cells, but no typical Sternberg cells and no eosinophil cells are present. There are a few very small areas of necrosis in the larger glands.

Clinical diagnosis.—This was a matter of great difficulty, as the glands removed by biopsy gave no clear histological picture. The diagnoses considered were splenic anæmia, tuberculosis, and Hodgkin's disease. Dr. Parkes Weber, who saw the case in consultation, was of opinion that the balance of evidence was in favour of the last diagnosis. The presence of achlorhydria is of interest, but it was probably secondary to the invasion of the stomach by the disease.

Course of illness.—During 11 weeks in hospital she suffered increasingly from pain, vomiting, and diarrhœa with blood in the vomit and stools. The temperature was irregular, the maximum being 100° F. Death occurred on Oct. 2nd, 1930, and an autopsy was held next day.

Post-mortem report (D. M. Vaux).—There is a chain of glands on both sides of the neck; the largest measures 1 × ½ in. They are discrete, firm, pale, and homogeneous. The axillary glands are moderately enlarged, the bronchial and mediastinal glands very slightly enlarged. There is enlargement of the mesenteric glands and of those along both curvatures of the stomach, round the cœliac axis, and along the whole length of the aorta and iliac vessels; The glands are discrete. There is localised peritonitis in the region of the stomach and spleen, and a small perforation in the middle of the anterior wall of the stomach, shut off by adhesions to the under surface of the liver. The surrounding area of the stomach is covered with blood and is necrotic. There are scattered irregular patches on both anterior and posterior walls of the stomach; the wall is firm and thickened in these areas, and the mucous membrane over them is raised, yellowish, and beginning to ulcerate. The small intestine appears atrophied, Peyer's patches are thickened, and the solitary follicles enlarged. The mucous membrane for half an inch above the ileocæcal valve is thickened and papilliferous. The large intestine throughout shows patches of thickened mucous membrane, especially in the cæcum and proximal end of the appendix.

FIG. 2 (Case 2).



Section of liver, showing fatty infiltration and diffuse white areas of growth round the portal fissure and passing into the liver substance along the lines of the vessels. The section passes through one of the glands in the hilum.

The spleen weighs 33 oz. There is perisplenitis, and the organ is adherent to the stomach and is very firm. The tissue on section is deep red, and closely set in parts with bluish-white nodules of the size of a pin's head; there are also "hard-bake" nodules at or near the surface. The liver is large, pale, and firm; its surface is smooth. On section it shows fatty change and diffuse white areas of growth round the portal fissure and passing into the liver substance along the lines of the vessels. No nodules are seen.

The kidneys, suprarenals, pancreas, and spinal canal are normal.

Histological examination (E. H. L.).—The glands of the neck show complete fibrosis, but no changes are to be detected in the thoracic glands. In the large abdominal glands no normal structure remains. There is a diffuse growth consisting of small cells having round or oval nuclei; there is considerable fibrosis and some necrosis, and a few isolated cells resembling Sternberg cells can be found (after prolonged search three typical multinucleated cells occurring together were discovered). There is marked fibrosis of the spleen, but no necrosis. Amyloid degeneration is present in the walls of the arteries. The changes are very advanced, and no typical lymphogranulomatous structure is found. There is a diffuse infiltration of the liver, spreading from the hilum along the vessels; this consists of small cells with round or oval nuclei and of polymorphonuclear leucocytes, but no Sternberg cells can be found. The infiltration is followed by very marked fibrosis, which has led to small areas of necrosis. There is marked fatty degeneration, but no amyloid change.

In the stomach wall there is marked infiltration of the mucous membrane and submucosa with lymphocytes and polymorphonuclear leucocytes; there is also considerable fibrosis which has obstructed the vessels and caused large areas of necrosis. The cæcum and colon show similar changes.

The marked involvement of the alimentary canal suggested at first that this was a case of lymphosarcoma (Turnbull [1]). A comparison of the histology with that of Case 1, however, leaves little doubt that the two cases are varieties of the same disease, though in Case 2 the lymphocytic type of cell predominates to the exclusion of the typical appearances. In Case 1, tissues were found showing every degree of change, from the typical Sternberg eosinophil granuloma to a growth composed of closely packed small cells exactly similar in appearance to those found in Case 2.

COMMENTARY (F. P. W.).

The first period of the illness in Case 1 appears fairly classical. The occasional association of tuberculosis with lymphogranulomatosis maligna has long been recognised; the cause of the connexion may be explained in different ways in different cases, but it should be remembered that the former disease is common, and the latter not exceedingly rare. Cutaneous pruritus often accompanies lymphogranulomatosis, especially in the earlier stages, sometimes constituting the chief symptom and occasionally leading to a kind of prurigenous dermatitis, and even to a generalised itching erythrodermia. In this case the most remarkable feature was the involvement of the vertebral periosteum, which doubtless caused the pains and paræsthesiæ in the shoulders and upper limbs. These sensory symptoms had led to a diagnosis during life of vertebral periosteal involvement.

In 1923 [2] and in 1926 [3] I described and collected accounts of cases of lymphogranulomatosis complicated by paraplegia or cauda equina symptoms and vertebral involvement, and since then various similar cases have been published.[4] It is clear that in a typical case of lymphogranulomatosis maligna, after the disease has run an ordinary course for a longer or shorter time, the ventral vertebral periosteum may become infiltrated and this infiltration may spread to the periosteum lining the vertebral canal and to the epidural fat, thus giving rise to pains and to paraplegia from the irritation and compression of the nerve roots and spinal cord.

From a necropsy in 1927 [5] it becomes probable that if the spinal column and epidural space were systematically examined in every fatal case of lymphogranulomatosis, even when no nervous symptoms had been recorded during life, lymphogranulomatous infiltration would be found to be more frequent than hitherto suspected.

But why does the vertebral periosteum become infiltrated in some cases, while in most cases it remains uninvolved? I suggest that in this case the periosteum became infiltrated through direct contact with lymphogranulomatous glands in which infiltration of the extracapsular connective tissue was in active progress. Dr. Lepper, in her report, mentions that the diseased lymph glands were matted together and formed dense masses, and had to be cut away from the vertebral periosteum. Looking back on my first case (a young man under hospital treatment from 1919 to 1921), I find that the lymphogranulomatous infiltration of the vertebral periosteum and epidural fat was associated with much involvement of the abdominal lymph glands, notably those about the vertebral column.[6] There can be no doubt that occasionally the lymphogranulomatous process extends beyond the capsules of the glands so as to invade the surrounding extracapsular tissue. O. Naegeli[7] mentions a case which on that account was formerly supposed by Dietrich to be one of lymphosarcoma. In a hospital patient of mine, aged 54 years, who died from lymphogranulomatosis maligna in January, 1915, the abdominal aorta near its bifurcation was found partially embedded in a hard, whitish growth, doubtless formed by the lymphogranulomatous transformation and matting together of para-aortic glands so as to form a firm fibroid mass.

Dr. C. P. Symonds has recently suggested that the lymphogranulomatous process may extend intracranially as it sometimes does into the intervertebral canal.[8]

Case 2 is especially interesting on account of the very extensive involvement of the alimentary canal, and the macroscopically remarkable infiltration of the liver along the lines of the great vessels; and even more so on account of the clinical and histological diagnosis between lymphosarcomatosis and lymphogranulomatosis maligna and the possible relationship between them. It should be noted that lymphosarcoma, as Turnbull[1] sees it, including many cases in which the spleen and liver are affected, is very different in its distribution from lymphosarcoma, as originally described in 1893 by the Viennese pathologist, Kundrat[9]; Naegeli[10] still follows Kundrat in regard to lymphosarcomatosis when he writes: "Wenig und oft gar nicht beteiligt sind Milz und Leber." I would suggest that the term "lymphosarcoma," or, when multiple, "lymphosarcomatosis," includes two diseases:—

(1) The lymphosarcomatosis of Kundrat and Naegeli, which is apparently a neoplastic disease, originating in the lymphoblastic elements of the affected lymphadenoid tissue.

(2) A variety or phase of lymphogranulomatosis maligna or, as we still call it, Hodgkin's disease.

I suggest that Hodgkin's disease originates in the endothelial elements of the reticulo-endothelial portion of the first affected lymphatic glands, or other lymphatic structure, and afterwards tends to become generalised in other regions of the body. Whether it is really a granulomatosis or a neoplastic disease is not yet clear; if the former, it is probably due to a virus, but if it is a neoplastic disease, the morbid or reaction-producing "agent" must still be regarded as the neoplastic process ("urge") itself. The cells of neoplasms more or less continue to exercise the functions of the normal cells from which they originated. One of the normal functions of the endothelial cells in question is, probably, to produce or accumulate lymphocytes near them, and, in fact, the reticulo-endothelial elements together with the lymphoblastic elements constitute "lymphadenoid tissue." In some lesions the crowded lymphocytes tend to dominate the histological picture and make it resemble a lymphosarcoma, whereas in other lesions the Sternberg-Read-Andrewes histological cellular features are more characteristic. In the present case the mainly lymphocytic picture was associated with much fibrosis, just as the Sternberg-Read-Andrewes features generally are (as exemplified in the first case).

(Continued at foot of next column.)

AN INQUIRY INTO REFERRED PAIN.*

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AND

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Recently the hypothesis of Ross, Mackenzie, and Head regarding referred pain has been challenged by Morley[1] as the result of a series of prolonged and careful investigations. These investigations have led Morley to believe that pain resulting from visceral disease is referred to a somatic cutaneous area only when the parietal peritoneum is involved; he utilises the phrenic nerve as an example. Thus when the diaphragmatic region of the abdominal cavity is involved in a disease process, pain is referred to the region of skin supplied by the fourth cervical segment, mostly in the region of the outer end of the clavicle. It had recently been stated by Lemaire,[2] Weiss,[3] and others, that referred pain can be abolished by local anæsthetisation of the cutaneous area to which the pain is referred. If this be so, the theory of referred pain, which is generally accepted, is rendered still more insecure. In support of this, Morley publishes evidence that the referred pain in the shoulder from the diaphragm can be abolished by novocain injection of the shoulder area.

This aspect of the problem of referred pain appeared to us to be worthy of investigation, and we have made observations during the operation of phrenic avulsion under local anæsthesia. The operative procedure was to infiltrate with novocain and adrenalin a line across the neck about two fingers' breadth above the clavicle, so situated that it crossed the posterior border of the sternomastoid muscle.

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* Observations communicated to the Medical Research Society at a meeting on Jan. 15th.

[1] Morley, J.: Abdominal Pain, Edinburgh, 1931.

[2] Lemaire: Rev. Méd. de Louvain, 1926, ix., 129.

[3] Weiss, S., and Davis, D.: Amer. Jour. Med. Sci., 1928, clxxvi., 517.

(Continued from previous column.)

DRS. HARE AND LEPPER: REFERENCES.

1. Turnbull, H. M.: Proc. Roy. Soc. Med., 1929–1930, xxiii. (Sect. Med.), 21.
2. Weber, F. Parkes: Quart. Jour. Med., 1923, xvii., 1.
3. ,, ,, : International Clinics, 1926, 36th Series, vol. i., p. 127.
4. East, C. F. T., and Lightwood, R. C.: THE LANCET, 1927, ii., 807: Poynton, J. F., and Harris, K. E.: Ibid., 1930, ii., 903; Carslaw, J., and Young, J. S.: Glasgow Med. Jour., 1927, cviii., 193; Eugénis, C., Thèse de Lyon, 1929 (with many references); Schaeffer, H., and Horowitz, A.: Presse Méd., 1930, xxxviii., 403; see also communications by Cain, Rachet, and Horowitz at the Soc. Méd. des Hôp. de Paris on Dec. 6th, 1929, and by Boidin, Fayot, and Beinis at the same society on July 4th, 1930; also Joly's communication at another society (Abstr., Presse Méd., 1931, xxxix., 466); and a report on two cases by Lemaître, Muller, and Nuytten (Abstr. Presse Méd., 1932, xl., 170).
5. Weber, and Bode, O. B.: THE LANCET, 1927, ii., 806.
6. Weber: Quart. Jour. Med., loc. cit. (ref. 2), Case 1.
7. Naegeli, O.: Blutkrankheiten, 3rd edit. (German), Berlin, 1919, pp. 521, 522.
8. Kisch, H.: Proc. Roy. Soc. Med., 1931–32, xxv. (Sect. Laryng.), 1.
9. Kundrat, H. K.: Wien. Klin. Woch., 1893, vi., 211 and 234.
10. Naegeli: Op cit. (ref. 7), 5th edit., 1931, p. 535.

Through an incision along this line the phrenic nerve was exposed and avulsed.

In all we have been present at nine such operations, and have made the following observations.

Firstly, the area of skin supplied by the third, fourth, and fifth cervical segments was investigated by pin-prick and by means of a soft camel-hair brush to ascertain that sensation was normal. The line of incision was then infiltrated and sensation again tested; it was thus established as to whether the anæsthesia was limited to the line of infiltration or included the supraclavicular nerves. The phrenic nerve was next exposed. By lightly pinching the exposed nerve pain was elicited, and the painful area mapped out. This area was then infiltrated subepidermally in some cases, subcutaneously in others, and both in still others. The nerve was again lightly pinched, and the painful area again mapped out. The nerve was then divided and both ends stimulated. In one or two cases the nerve was injected, then lightly pinched proximally and distally to the injection. Finally the nerve was avulsed.

The following experiment is illustrative of our findings in all.

G.i. (1) Preliminary tests showed that the skin over the right shoulder and cervical region was of normal sensitivity.
(2) Subcutaneous infiltration with novocain and adrenalin along the line of the intended incision caused only anæsthesia limited to the line of the incision.
(3) The phrenic nerve was exposed.
(4) It was lightly pinched, causing the patient to flinch and to complain of severe pain which was localised to an area of about the size of a shilling internal to the acromioclavicular joint.
(5) This area of referred pain was infiltrated in the subepidermal tissues with novocain and adrenalin; and this area on testing was found to be completely anæsthetic.
(6) The phrenic nerve was again lightly pinched; the patient flinched as before and referred the pain to a region slightly below and external to the previous point. The amount of displacement was not more than 1·0–1·5 cm.
Both areas corresponded to areas of reference as mapped out by Head.
(7) This area was further infiltrated and on testing proved to be anæsthetic. Pinching the phrenic consequent to this last infiltration again elicited pain which was on this occasion referred to the previous area of reference, though it was still an anæsthetic area.

Mr. Roberts has repeated these observations in many other cases and has constantly found the same phenomena.

In all nine cases similar results were obtained; in no case was the referred pain altered in character or intensity; in only two was a very small degree of shift determined, and such shift was easily explicable on the difficulty of localising accurately such pain. Stimulation of the distal end of the cut nerve caused no pain, while a stimulation of the proximal end invariably caused referred pain. Thus reference is only obtainable from the proximal end of the divided or blocked nerve. This latter point is of importance in excluding the possibility of the pain having been elicited by stimulation of the tissues around the phrenic nerve. Finally, all the cases on X ray examination following the operation exhibited paralysis of the diaphragm.

CONCLUSIONS.

(1) The diaphragm behaves as a viscus, since light compression of the phrenic nerve occasions no sensation referable to its anatomical site.

(2) On stimulation of the phrenic nerve ascending impulses occur which are felt as pain and are referred.

(3) The area of referred pain is almost identical in all subjects and belongs to the fourth cervical segmental distribution.

(4) Anæsthesia of the area of referred pain in no way affects the character or intensity of the referred pain, and that the locality of the referred pain, apart from the occasional slight shift already mentioned, is not altered. Thus the pain must be due to a reference by higher centres of activity arising in the spinal segment corresponding to the nerve stimulated.

One of us (E. A. C.) carried out this work while in receipt of a *personal grant from the Medical Research* Council.

THE LEUCOPOIETIC VALUE OF SULPHUR.

By T. D. Power, M.D. Dub., M.R.C.P. Lond.,
D.P.H., D.P.M.,
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For the past two years injections of sulphur in oil have been widely employed in the treatment of a variety of conditions, prominent among which are general paralysis of the insane and dementia præcox. The primary object of the therapy is to produce a series of pyrexial bouts, and any good results which ensue are usually attributed to the beneficial effects of the fever. On a previous occasion,[1] I drew attention to the fact that intramuscular injections of sulfosin * are almost invariably followed by a considerable degree of leucocytosis, which may persist for as long as 48 hours, and which tends to increase rather than to diminish as the treatment progresses. Since that time, it has been possible to carry out a number of animal experiments, the results of which may be of some interest to those who employ this drug in clinical practice.

EXPERIMENTS ON ANIMALS.

If a rabbit is given a series of daily injections of sulfosin, an increase in the number of white cells in circulation becomes evident within a few days, and this leucocytosis is more or less maintained as long as the treatment is continued. Fig. 1 illustrates very well what occurs. On it are recorded the results of a number of leucocyte counts, performed daily on a rabbit, over a period of nine weeks.

For the first four weeks, during which no sulphur was administered, control observations were made, and the broken line indicates that throughout this period the number of leucocytes never exceeded 9000 per c.mm. The temperature (unbroken *line*) varied between 101·2° and 103·4° F. which is within the limits of normality for a rabbit. A the commencement of the fifth week the animal was given an injection of 1 c.cm. of sulfosin, and this dose was repeated on 23 consecutive days. After the fourth of these injection the leucocytic curve commenced to rise, and remained above the normal upper limit during the whole period o inoculation. Well-marked oscillations occurred from tim to time, and the highest count recorded was 25,500 per c.mm When 23 doses had been administered the sulfosin wa discontinued, and thereafter the number of leucocytes began to diminish, normal limits being regained within a few days

The leucocytosis was due to an increase of polymorphonuclear cells, which corresponds with wha occurs under similar circumstances in man. Th animal appeared to suffer no discomfort throughou the experimental period, except on one occasion after the twenty-third injection, when it seemed ou of sorts, and exhibited a subnormal temperature A day or two after the withdrawal of the dru, this indisposition had completely passed away, and the rabbit seemed as lively and healthy as ever It will be noticed that no marked elevations o temperature appear upon the chart, but this is probably because readings were taken only once in the 24 hours.

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[1] Power, T. D.: THE LANCET, 1930, ii., 1289.

* This is the trade name given to a preparation consisting of 1 per cent. suspension of sulphur in oil.

The above experiment was repeated on eight rabbits with substantially the same results. The bone-marrows of these animals were submitted to microscopical examination, and in every case a marked degree of hyperplasia was found to have occurred. This varied in proportion to the amount of sulfosin administered, and in some cases was evident macroscopically as well as microscopically. The leucoblastic tissue was most affected, but the erythroblastic elements and megakaryocytes did not entirely escape. Fig. 2 illustrates the general appearance of such a bone-marrow, and may be compared with Fig. 3, which represents the same organ of an untreated rabbit under identical magnification. Both specimens were taken from the femur. It will be noticed that in the case of the treated

FIG. 1.

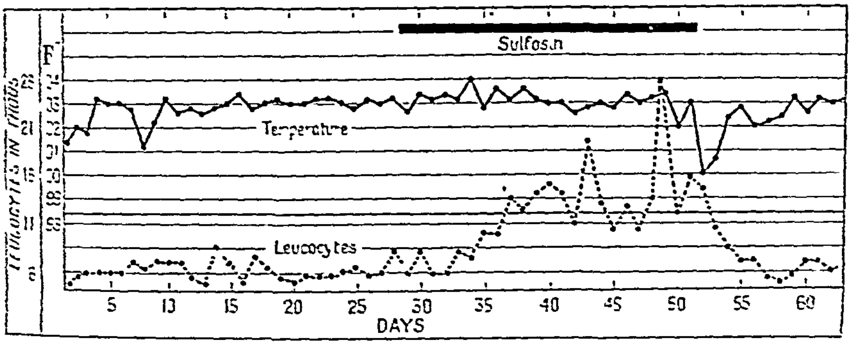
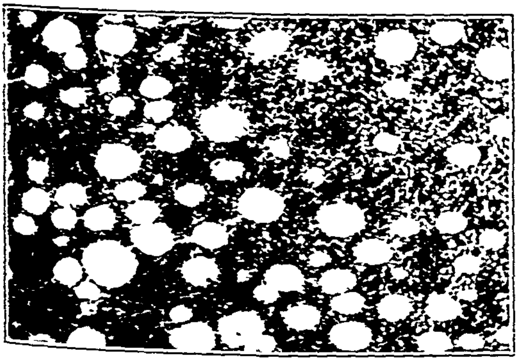


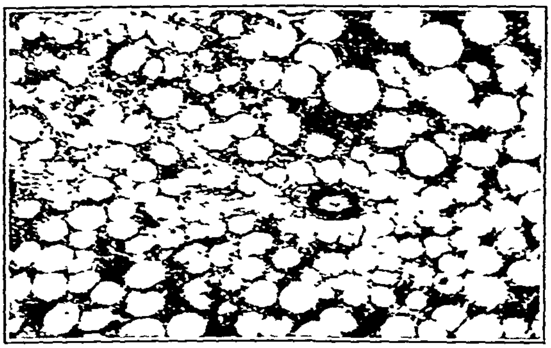
Chart showing effect of sulfosin on temperature and leucocyte count (in thousands)

FIG. 2.



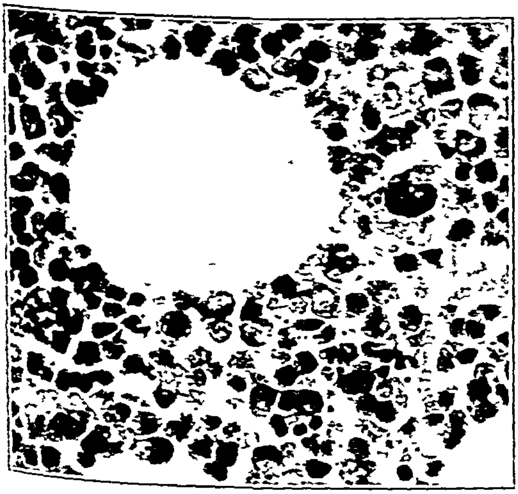
Illustrates hyperplastic condition of bone-marrow after administration of 29 injections of sulfosin. Note the decrease in number of fat spaces, and marked excess of cellular tissue. (× 75.)

FIG. 3.



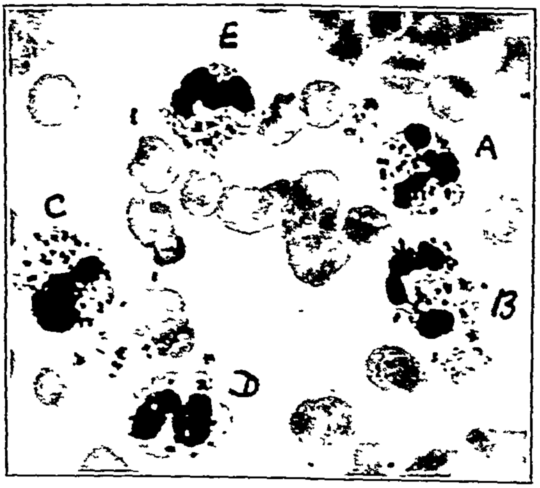
Illustrates appearance of normal rabbit's bone-marrow taken at same magnification as Fig. 2. (× 75.)

FIG. 4.



A higher magnification of hyperplastic bone-marrow shown in Fig. 2. Illustrates in detail nature of newly formed cellular elements. The cells with deeply staining nuclei are erythroblasts, while those with granular cytoplasm are either myelocytes or polymorphonuclear leucocytes. There are two giant cells in the photograph. (× 560.)

FIG. 5.



Phagocytosis following sulfosin administration. Blood taken from patient exhibiting leucocytosis and incubated with bacteria. Cells marked A, B, and C are mature polymorphonuclear leucocytes, and have ingested a considerable number of cocci: cells E and D have not yet begun to show nuclear lobulation, and only manifest slight phagocytic activity. (× 1000.)

Through an incision along this line the phrenic nerve was exposed and avulsed.

In all we have been present at nine such operations, and have made the following observations.

Firstly, the area of skin supplied by the third, fourth, and fifth cervical segments was investigated by pin-prick and by means of a soft camel-hair brush to ascertain that sensation was normal. The line of incision was then infiltrated and sensation again tested; it was thus established as to whether the anæsthesia was limited to the line of infiltration or included the supraclavicular nerves. The phrenic nerve was next exposed. By lightly pinching the exposed nerve pain was elicited, and the painful area mapped out. This area was then infiltrated subepidermally in some cases, subcutaneously in others, and both in still others. The nerve was again lightly pinched, and the painful area again mapped out. The nerve was then divided and both ends stimulated. In one or two cases the nerve was injected, then lightly pinched proximally and distally to the injection. Finally the nerve was avulsed.

The following experiment is illustrative of our findings in all.

G.i. (1) Preliminary tests showed that the skin over the right shoulder and cervical region was of normal sensitivity.

(2) Subcutaneous infiltration with novocain and adrenalin along the line of the intended incision caused only anæsthesia limited to the line of the incision.

(3) The phrenic nerve was exposed.

(4) It was lightly pinched, causing the patient to flinch and to complain of severe pain which was localised to an area of about the size of a shilling internal to the acromio-clavicular joint.

(5) This area of referred pain was infiltrated in the subepidermal tissues with novocain and adrenalin; and this area on testing was found to be completely anæsthetic.

(6) The phrenic nerve was again lightly pinched; the patient flinched as before and referred the pain to a region slightly below and external to the previous point. The amount of displacement was not more than 1·0–1·5 cm. Both areas corresponded to areas of reference as mapped out by Head.

(7) This area was further infiltrated and on testing proved to be anæsthetic. Pinching the phrenic consequent to this last infiltration again elicited pain which was on this occasion referred to the previous area of reference, though it was still an anæsthetic area.

Mr. Roberts has repeated these observations in many other cases and has constantly found the same phenomena.

In all nine cases similar results were obtained; in no case was the referred pain altered in character or intensity; in only two was a very small degree of shift determined, and such shift was easily explicable on the difficulty of localising accurately such pain. Stimulation of the distal end of the cut nerve caused no pain, while a stimulation of the proximal end invariably caused referred pain. Thus reference is only obtainable from the proximal end of the divided or blocked nerve. This latter point is of importance in excluding the possibility of the pain having been elicited by stimulation of the tissues around the phrenic nerve. Finally, all the cases on X ray examination following the operation exhibited paralysis of the diaphragm.

CONCLUSIONS.

(1) The diaphragm behaves as a viscus, since light compression of the phrenic nerve occasions no sensation referable to its anatomical site.

(2) On stimulation of the phrenic nerve ascending impulses occur which are felt as pain and are referred.

(3) The area of referred pain is almost identical in all subjects and belongs to the fourth cervical segmental distribution.

(4) Anæsthesia of the area of referred pain in no way affects the character or intensity of the referred pain, and that the locality of the referred pain, apart from the occasional slight shift already mentioned, is not altered. Thus the pain must be due to a reference by higher centres of activity arising in the spinal segment corresponding to the nerve stimulated.

One of us (E. A. C.) carried out this work while in receipt of a personal grant from the Medical Research Council.

THE LEUCOPOIETIC VALUE OF SULPHUR.

By T. D. Power, M.D. Dub., M.R.C.P. Lond., D.P.H., D.P.M.,

DEPUTY MEDICAL SUPERINTENDENT, BRENTWOOD MENTAL HOSPITAL.

For the past two years injections of sulphur i oil have been widely employed in the treatment a variety of conditions, prominent among whic are general paralysis of the insane and dementi præcox. The primary object of the therapy is t produce a series of pyrexial bouts, and any goo results which ensue are usually attributed to the beneficial effects of the fever. On a previous occasion,[1] I drew attention to the fact that intramuscular injections of sulfosin * are almost invariably followed by a considerable degree of leucocytosis, which may persist for as long as 48 hours, and which tends to increase rather than to diminish as the treatment progresses. Since that time, it has been possible to carry out a number of animal experiments, the results of which may be of some interest to those who employ this drug in clinical practice.

EXPERIMENTS ON ANIMALS.

If a rabbit is given a series of daily injections of sulfosin, an increase in the number of white cells in circulation becomes evident within a few days, and this leucocytosis is more or less maintained as long as the treatment is continued. Fig. 1 illustrates very well what occurs. On it are recorded the results of a number of leucocyte counts, performed daily on a rabbit, over a period of nine weeks.

For the first four weeks, during which no sulphur was administered, control observations were made, and the broken line indicates that throughout this period the number of leucocytes never exceeded 9000 per c.mm. The temperature (unbroken line) varied between 101·2° and 103·4° F., which is within the limits of normality for a rabbit. At the commencement of the fifth week the animal was given an injection of 1 c.cm. of sulfosin, and this dose was repeated on 23 consecutive days. After the fourth of these injections the leucocytic curve commenced to rise, and remained above the normal upper limit during the whole period of inoculation. Well-marked oscillations occurred from time to time, and the highest count recorded was 25,500 per c.mm. When 23 doses had been administered the sulfosin was discontinued, and thereafter the number of leucocytes began to diminish, normal limits being regained within a few days.

The leucocytosis was due to an increase of polymorphonuclear cells, which corresponds with what occurs under similar circumstances in man. The animal appeared to suffer no discomfort throughout the experimental period, except on one occasion, after the twenty-third injection, when it seemed out of sorts, and exhibited a subnormal temperature. A day or two after the withdrawal of the drug this indisposition had completely passed away, and the rabbit seemed as lively and healthy as ever. It will be noticed that no marked elevations of

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[1] Power, T. D.: The Lancet, 1930, ii., 1289.

* This is the trade name given to a preparation consisting of a 1 per cent. suspension of sulphur in oil.

In the case of extreme catatonic stupor the difference in the temperature response to sulfosin was so marked that it is considered separately from the other 22 cases. The maximum temperature obtained was 101·8° F. and the smallest peak was 99·0° F. The mean of all the peaks was 100·4° F. The technique of the injections was in all respects similar to that employed in the other cases, and the patient has not improved in the 14 months which have ensued since the injections.

Only definite cases of dementia præcox were included and, of course, no case displaying any physical abnormality was subjected to the treatment. There was no discrimination on the question of the probable duration, the longest being of at least 11 years' standing and the most recent being of at least two to three years' duration. Cases in which a definite degree of mental deterioration was obvious were not included in the series. In no case can it be claimed that complete normality ensued, but seven cases showed varying degrees of improvement, and the remaining 16 cases showed no improvement at all. Of the cases which showed improvement, four showed a marked improvement, and three a moderate improvement. Even in the cases that improved most markedly the shadowy background of the psychosis, best described as a definite "schizophrenic personality," persisted. Six months has elapsed since the last of the series was treated, and one case has relapsed—i.e., one of the four showing marked improvement.

The above results are not very encouraging, and this all the more so when one takes into account how difficult it is to assess how far any improvement can be attributed to sulfosin, since the possibility of the occurrence of spontaneous improvement has to be considered. Assuming that the sulfosin is responsible for certain of the improvements recorded, it has yet to be determined whether these beneficial results are due to the pharmacological effects of the sulfosin or to a possible factor suggested by McCowan—i.e., the intensive individual nursing attention that patients undergoing the treatment receive. However, a therapeutic measure which may hold out any hope of even a slight improvement in the prognosis of this disease appears to be justified until supplanted by something more specific.

I am indebted to Dr. F. L. Golla, Dr. P. K. McCowan, and Dr. N. Roberts for their interest, and to the latter for permission to publish the cases.

CLINICAL AND LABORATORY NOTES

VARIOLA MINOR COMPLICATED BY APPENDICITIS DUE TO THREADWORMS.

By A. T. W. POWELL, M.C., M.B., B.S. LOND., D.P.H.,

MEDICAL OFFICER OF HEALTH FOR THE BOROUGH OF WALTHAMSTOW.

A BOY, aged 13, unvaccinated, was notified by Dr. William Menzies on Jan. 19th, 1931, as suffering from variola minor. He was removed to Walthamstow Small-pox Hospital on the same day for isolation and treatment.

The onset of illness with backache and headache was on Jan. 14th, and the rash appeared on the 18th. On admission to hospital on the 19th, there was a copious eruption, but the boy had little or no constitutional disturbance and no fever. On the 29th, however, a fresh eruption occurred which was entirely superficial and of an urticarial character. On this day the hospital was visited by Dr. W. V. Shaw who saw this patient. He remarked that a secondary eruption sometimes occurred during the period of desquamation in small-pox. In view, however, of later findings in this case the urticaria may have been due to another cause. The secondary eruption increased in extent until Jan. 31st, when it began to subside.

A few days later, on Feb. 3rd, this boy suffered some pain in the abdomen and by the next day had slight pyrexia and a pulse-rate of 92 per minute. On examination it was found that there were few physical signs, but some tenderness on deep pressure in the right iliac fossa was discovered; also rectal examination caused pain in the right side of the abdomen. A provisional diagnosis of appendicitis was made and the patient was kept under close observation. Four-hourly temperatures were taken and by 10 P.M. it was found that the temperature was 102° F. and the pulse-rate 110 per minute. By this time a diagnosis of appendicitis seemed quite clear.

The boy had recovered from his attack of variola minor, desquamation was complete, and in fact, he might have been discharged, but probably *no general hospital would have* accepted him as a patient.

Mr. M. J. Smyth, saw the patient in the early hours of Feb. 5th, and confirmed the diagnosis of appendicitis. He had brought the necessary instruments and dressings and a two-bed hut was hastily improvised as an operating theatre.

The operation was straightforward and no complications were met with. A long appendix with no external inflammation and apparently normal was removed. Subsequently, when the appendix was opened a small area of inflammation was found about the middle of its length, and half a centimetre in diameter. In the centre of this inflamed area was a single threadworm.

The patient made an uneventful recovery and was discharged on Feb. 23rd.

A CASE OF ANTHRAX.

By G. DE BEC TURTLE, M.D. DURH., M.R.C.P. LOND.

A WOMAN, aged 71, consulted me complaining of a painful swelling at the back of her neck, which she thought was the result of a sting three days previously. She looked ill and very toxæmic, the temperature was 99° F., and the pulse-rate 100. On examination there was a minute black spot with one vesicle at the side, situated over the seventh cervical spine, a large surrounding area being indurated, and malignant pustule was suspected.

In the evening of the same day the temperature had risen to 102° F., and the pulse to 112. The induration had increased, and the black spot was larger, several vesicles having appeared around it. A microscopical search of the serum from a vesicle did not reveal any anthrax bacilli, and it was concluded that the infection must be streptococcal in origin; 20 c.cm. of anti-scarlet fever serum was injected subcutaneously. On the following morning the temperature was 100° F., and the pulse-rate 100, and the patient's general condition appeared a little better, but the local condition had not altered at all. By the afternoon of the same day, however, the temperature was 102° F., and the pulse-rate 104, and the induration had markedly increased, extending round the neck and down over the clavicles into the breast tissue. Excision of the pustule was decided upon, and the same evening was performed under gas-and-oxygen anæsthesia, a large area being excised. A crucial incision was made, and four flaps dissected animal there is a definite diminution in the number of the fat spaces, and a corresponding increase in the cellular elements, which, of course, consist of developing blood corpuscles. A better idea of the nature of the newly formed tissue may be obtained from Fig. 4, which depicts the same specimen as that shown in Fig. 2 under higher magnification. The majority of the cells appearing in this photograph consist of myelocytes or polymorphonuclear leucocytes, but there is a fair sprinkling of darkly stained erythroblasts, and two megakaryocytes are also seen. The nucleus of one of the latter appears to be pyknotic, but this is not an uncommon finding in the bone-marrows of normal rabbits.

PHAGOCYTIC ACTIVITY.

I have given only the barest outline of these animal experiments, but anyone who is sufficiently interested can repeat them for himself. I cannot conclude, however, without briefly referring to another aspect of sulphur therapy as applied to the human subject. A certain number of patients in whom a leucocytosis has been evoked in this way exhibit a "shift to the left" of the Schilling index, and this "shift" tends to become more marked with a repetition of the injections. It occurred to me that it might be of some interest to investigate the behaviour towards bacteria of such strongly stimulated leucocytes when incubated with the patient's own serum.

With this object in view, I utilised the technique devised by Knott [2] for the purpose of controlling the doses of X rays in the treatment of leukæmia. An emulsion of well-washed staphylococcal bacteria was incubated with four times its volume of a sample of blood obtained from a patient the day after an injection of sulfosin. The individual in question showed at the time a considerable leucocytosis, with a well-marked "shift to the left" of the Schilling index. After the lapse of 20 minutes the mixture was removed from the incubator, and stained preparations made in the ordinary way. Fig. 5 depicts a photomicrograph of one of these blood smears, and shows very clearly what has occurred. The cells marked A, B, and C are mature polymorphonuclear leucocytes, and have ingested a considerable number of bacteria, whereas the cells E and D, where nuclear lobulation is only just about to commence, manifest phagocytic activity to a very poor degree. The experiment was repeated on several occasions with the same result.

The experiments described show that sulfosin is a powerful leucoblastic stimulant, and the leucocytes which appear in the circulation are capable—at any rate in vitro—of exhibiting a degree of phagocytic activity. Whether or not this property of sulphur might be utilised clinically is a very different matter, but at all events it is as well that those who induce fever by this method should be aware of what is taking place in the patient's body.

In conclusion, I may mention that, from the standpoint of research, sulfosin has a very definite value, for when it is employed in conjunction with vital staining, beautiful microscopical preparations illustrating the developmental history of the blood-cells can be obtained.

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[2] Knott, F. A.: Guy's Hospital Rep., April, 1930.

NORTHAMPTON GENERAL HOSPITAL.—During the year ended July 1st, 1931, the in-patients numbered 4207, a slight increase; 254 were private patients. Their average stay was 19 days, and their average cost £7 19*s*. 3*d*., a reduction of 2*s*. 4*d*. The average daily cost per bed was 8*s*. 8*d*., a reduction of 5*d*. There were 18,230 out-patients, a small increase; the average cost of each was 7*s*. Nearly one-fourth of the in-patients spent an average of 13 additional days in the Margaret Spencer Home of Rest, which is now used as a hospital for recovery for cases needing further treatment. An out-patient clinic for the treatment of early mental cases has been established.

TREATMENT OF DEMENTIA PRÆCOX WITH SULFOSIN.

BY WILLIAM MCCARTAN, M.D., D.P.H. BELF., D.P.M

SENIOR ASSISTANT MEDICAL OFFICER, WEST PARK MENTAL HOSPITAL, EPSOM.

A SERIES of 23 cases of dementia præcox has be treated with sulfosin, introduced and advocat by Schroeder.

The injections were made into the tissues imm diately around the periosteum of the femur, t needle being passed into the middle third of t lateral aspect of the thigh. The danger of femo periostitis appeared to be very real and consequen aseptic precautions were rigid. A more rem danger is that of oil embolism and a routine pract was made of attempting to withdraw the plun of the syringe a little when the latter was in situ a of refraining from introducing sulfosin into the th if the least quantity of blood in the syringe show that a vessel of any size had been inadverten punctured. Blood was withdrawn on three differ occasions during the series.

The usual procedure was *to start with* doses 1 c.cm. and repeat the dose at four-day interv increasing by 1 c.cm. at each subsequent inject until a total of eight to ten injections had been giv Rapid general debilitation was noticed in most ca but this was transient and at the end of a course injections patients rapidly regained their nor state of nutrition. Apart from this temporary of weight and a certain stiffness and discomfor the legs at the site of the injections, no phys disability could be attributed to the sulphur. case certainly did appear to develop a pye subsequently, but in this case it is believed that condition had been somewhat remotely pre-exist and had been latent during the treatment.

The pyrogenetic action of sulfosin was mar in all patients except one—a case of extreme catat stupor which will be referred to separately la The temperature commenced to rise usually in f seven to ten hours from the time of the inject but periods of as short as three hours and as lon 20 hours were noted. In each patient the lengt this "incubation period" varied greatly with different injections. This variation was enti irregular and corresponded in no way with the of the injection. Similar irregularity was obse in the time it took the temperature to reach maximum—e.g., in one case it took only one to reach a maximum of 104° F. after the fo injection but after the fifth injection it took 20 h to reach a maximum of 103·8° F. The duratio the fever on each occasion was usually somew between 30 and 40 hours, but here again there a wide irregularity, the shortest pyrexial period b ten hours (maximum temperature on this occa being 102·8° F.), the longest pyrexial period b 62 hours (the maximum temperature on this occa being 102·4° F.). The case which subseque showed a flare-up of a pre-existing pyelitis did pre on one occasion a temperature which lasted 72 ho but one is inclined to assume that the pyrexia in case may have been influenced by the latent condi of the kidneys. The mean of the height of all peaks of all cases (excluding the one case of catat stupor already referred to) was 103·2° F. The smal peak recorded in any case was 100·2° F., the high 104·6° F.

MEDICAL SOCIETIES

MANCHESTER MEDICAL SOCIETY.

A MEETING of this society on Feb. 3rd, with Prof. J. S. B. STOPFORD, the President, in the chair, was devoted to

Poliomyelitis.

Dr. R. W. FAIRBROTHER said that there seemed to be no doubt that the causative agent was a small particulate body belonging to the group of filtrable viruses. As it could not be cultivated by the ordinary means it could only be studied by animal inoculation. The following properties had been established, despite experimental difficulties; it was extremely resistant to freezing, drying, pure glycerin, and 0·5 per cent. phenol, but was readily destroyed by heat over 45° C. and oxidising agents. It retained its activity when left in milk at room temperature for 30 days. It could not yet be obtained entirely free from nervous tissue, which might modify its activity.

The epidemiology of the disease presented a fascinating but complex problem, and the theory propounded to explain it was that the virus was usually present in a populous community and infected a large number of people, most of whom developed a "sub-clinical" infection and so acquired immunity and became healthy carriers. Those who had actually developed the disease were usually children between the ages of 1 and 12; infants probably escaped owing to limited exposure to infection and the presence of maternal antibodies in their blood. Most children over 12 had acquired immunity, and after a widespread outbreak the majority of people had marked immunity, so that the soil was not suitable for the persistence of the virus. The chance of sub-clinical infections occurring during the next few years was then diminished, and a susceptible community might be produced. The introduction of the virus into a virgin population had caused extensive outbreaks involving persons of all ages.

The mode of spread was probably droplet infection from the nasopharynx. but some authorities held that drinking water or milk might convey the disease. The seasonal incidence remained unexplained. There was a difference in individual response, producing spinal, bulbar, and abortive forms of the disease, as well as certain rare and ill-defined varieties. The variations depended on the dosage of the virus received and possibly on different strains, as well as on the degree of resistance of the individual. Recent researches suggested that the virus, invading the tissues of the nasopharynx, passed to the brain by the axons of the olfactory nerve and thence to the cord by the motor fibres of the pyramidal tract, attacking various nerve-cells on the way. There was no evidence to suggest that it travelled via the cerebro-spinal fluid or the blood stream.

The clinical picture was very varied; there was frequently a prodromal stage characterised by fever, headache, vomiting, and malaise, with typical changes in the cerebro-spinal fluid—a pleocytosis, first polymorphonuclear and then mononuclear, and slight increase in the globulin, with no alteration in the sugar and chloride content. The mortality varied, but was usually about 10 per cent., and death was often due to involvement of the respiratory and cardiac centres. The characteristic lesions found post mortem were degeneration and vacuolation of the nerve-cells with neuronophagia, perivascular and meningeal infiltration.

Active measures should be commenced in the prodromal stage, and it seemed advisable, when poliomyelitis was in the locality, to regard all vague pyrexial conditions as potential cases and to examine the cerebro-spinal fluid. General measures included immediate isolation, rest, fluid diet, attention to the bowels, and symptomatic treatment. With these *measures alone many cases cleared up entirely.*

SPECIFIC THERAPY.

Protective immunisation could not be produced actively; the danger of introducing active virus into human beings was too great at present. Much progress in passive immunisation had been made during the last two years. It was essential that any serum used should possess a definite marked antiviral activity, and this could only be tested by the neutralisation test on monkeys. Convalescent human serum had proved extremely valuable, but its disadvantage lay in the time and trouble required to collect large quantities, and the need for preliminary precautionary tests on volunteers. Normal human serum might prove useful when antiviral serum was not obtainable, but strict neutralisation tests were necessary, since not every human serum was satisfactory. Immune monkey serum had very limited value, for the yield of serum per monkey was very small. Immune horse serum had only been fully investigated recently; only a limited number of horses produced a satisfactory serum, but those that did produced a good deal of it. There appeared no scientific justification for the use of antistreptococcal serum.

The serum used should be filtered, subjected to full sterility tests, sealed in ampoules, and stored at a low temperature. There seemed to be no reason why all large hospitals for children should not keep a stock of it. In the event of an outbreak of poliomyelitis all contacts, especially children, should receive a prophylactic dose of about 20–25 c.cm. intramuscularly. If the outbreak did not subside a further dose should be given after four or five weeks. Desensitisation would then be necessary. Similar treatment might be employed for doubtful cases before diagnosis was made, and gargling with antiseptic lotions might also be useful.

Therapeutically, the earlier the serum was given the better. It was therefore a good plan to examine the cerebro-spinal fluid at the bedside so that the serum could at once be given intrathecally if the diagnosis was confirmed. As large a dose as possible should be given; an average was 20 c.cm. intrathecally, warmed to 37° C., and 30 c.cm. intramuscularly or intravenously. The dose should be repeated every 24 hours until improvement was observed. The patient must be kept under observation for some time after the attack had settled down, as delayed attacks sometimes occurred. The results of serum treatment were not so successful after paralysis had appeared, but it might limit the spread of the lesions and so reduce the amount of permanent damage; it should therefore always be given. There seemed no doubt whatever of the beneficial effects of therapeutic serum. Its administration was comparatively harmless, whereas failure to give it might cause lifelong crippling.

back, exposing an area about 2 inches in diameter. The most severely indurated tissue was excised and the wound was packed. As will be seen from the pathologist's notes, anthrax bacilli were grown in scanty numbers from a portion of the excised material.

Sclavo's serum (40 c.cm.) was administered immediately after the report from the pathologist was received, and 10 c.cm. more the next day. The temperature fell, the pulse improved, and the indurated area began to decrease in size. The wound was dressed at first with solution of perchloride of mercury 1 in 2000, later with acriflavine, and finally with eusol. The patient has made a slow but uneventful recovery.

Pathologist's report.—Swabs taken showed in direct smears one or two isolated cocci and an occasional pair of degenerate cocci. There were no cells present in the exudate. Cultures gave a very scanty growth of *Staphylococcus albus*. Cultures from the excised material on the following day showed two colonies of staphylococci and two colonies of *B. anthracis* on six heavily inoculated tubes. The organisms were therefore extremely scanty, and none was detected in direct smears. The identity of the colonies of *B. anthracis* has been established by inoculation into mice; the mice died between 24 and 32 hours after inoculation with a pure culture of the bacilli, and post-mortem bacillus anthrax in very large numbers and pure culture was recovered from heart's spleen pulp and peritoneal exudate. The swabs from the wound taken four days later showed pus cells and large numbers of staphylococci, and the cultures have given a pure growth of *Staphylococcus aureus*.

The case is of interest as occurring in a patient who lived in a hotel, a community where anthrax is not likely to be met with or suspected. No history could be obtained of any recent purchase of furs or new brushes, in fact it was entirely negative.

I am greatly indebted to Mr. Arthur Edmunds and Dr. E. ff. Creed for their assistance.

London, W.

A CASE OF
PSYCHOSIS WITH HYPERTHYROIDISM
TREATED BY ERGOTAMINE.

By John H. Ewen, M.R.C.S. Eng., D.P.M.,
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Among others, Rothlin[1] and Porges and Adlersberg[2] have studied the action of ergotamine in endocrine disorders, especially Graves's disease. Ergotamine is an inhibitor of the sympathetic, its action being analogous to that of atropine on the parasympathetic. It diminishes the tonus of the sympathetic, and according to Maier[3] this beneficial diminution persists after discontinuing the treatment. Its use in Graves's disease is not without danger, and Labbé and Besançon[4] have recorded cases in which its exhibition has been followed by hemiplegia and collapse; but, as Porges has pointed out, there is often a personal idiosyncrasy to ergotamine in cases of hyperthyroidism, and these ill-effects may be avoided by adopting a judicious dosage and regulating the dose to the individual case.

The undoubted benefit conferred by ergotamine in certain cases of hyperthyroidism seems to justify its employment in the mental disorders associated with exophthalmic goitre, and in the case described below its use was followed by most encouraging results.

A married woman, aged 30, was admitted under certificate to Netherne Mental Hospital on Jan. 21st, 1931. For some time previously she had been receiving treatment at a private mental hospital.

Mental state.—She was excited, restless, confused, and extremely impulsive. Her conversation was disconnected, rambling, and almost incoherent, and she displayed complete lack of insight. She had vague persecutory ideas, and was suspicious and apprehensive. At times she became very agitated, and laughed and cried without reason. She was particularly prone to emotional outbursts, during which time she showed several marked mannerisms. On the day after admission she made a determined attempt to escape, and on several occasions only the most careful supervision circumvented her efforts to get away. A month afte admission she made a serious attempt at suicide, and following this she was regarded as actively suicidal an placed under special care. Briefly, she was entirely irresponsible, and her mental condition was such that a mos guarded prognosis was indicated.

Physical condition.—She was sallow and thin. Pulse rate 70, regular. There was some slight enlargement o the thyroid and exophthalmos was present but not marked There was no tremor. A month after admission, howeve the signs of exophthalmic goitre became more eviden There was tachycardia, with tremors of the hands, and th exophthalmos became obvious. The thyroid increased i size, and the circumference of the neck appeared to var with her mental state, being greater when her ment symptoms were worse. At this period the basal metaboli rate was +32·9 (Read's formula).

Treatment.—Five months after admission treatment b ergotamine was commenced. Subcutaneous injections 0·25 c.cm. ergotamine tartrate were given daily and, i the absence of secondary effects, the dose was increased 0·5 c.cm. This was continued for three weeks, and followe by oral administration of 0·001 g. ergotamine t.d.s. for anoth three weeks. At the same time dietetic measures we adopted, and proteins reduced to a minimum. Milk a butter were also restricted, and carbohydrates increase Under this régime she lost 4 lb.

Results of treatment.—Mentally there has been very evide improvement. The patient is now rational, convers normally, and displays marked insight. The agitation h completely disappeared, and the restlessness and impulsiv ness which were such a feature of her previous mental sta have been replaced by calmness and judgment. There is realisation of responsibility, and in place of confusion logical sequence of thought. Her mannerisms have d appeared. With regard to the thyroid condition, there now very little enlargement of the gland. Tremor a tachycardia are absent, and exophthalmos is only very sligh The basal metabolic rate is +27·5 (Read's formula). S has been discharged, and the latest reports indicate th she is leading a normal useful life.

This case is remarkable for the severity of t mental symptoms, the difficulty of prognosis, a the rapidity of improvement under ergotamine.

I am indebted to Dr. P. C. Coombes, medic superintendent of Netherne Mental Hospital, f permission to publish these notes.

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[1] Rothlin, E.: Med. World, Nov. 4th, 1927.
[2] Porges, O., and Adlersberg, D.: Bull. et mém. Soc. méd. hôp. de Paris, 1929, liii., 1202.
[3] Maier, H. W.: Rev. Neurol., 1926, xxxiii., 1104.
[4] Quoted by Porges (ref. 2).

Prince of Wales's Hospital.—Sir Albert Barra recently laid the foundation-stone of a new out-patien department at this Tottenham hospital which, when co pleted, will cost £30,000, and will include tonsil and aden departments and wards for paying patients. Owing lack of means, the first part only of the scheme is bei undertaken at present.

From "Cottage" to "General" Hospital. During the past fortnight the governing bodies of t cottage hospitals, Romford and Malmesbury, have decid to call them general hospitals. The reason given for t change at Victoria Cottage Hospital, Romford (33 bed is that the limitation in the name makes it difficult obtain nurses, and that probationers feel that they wasting their time at "a dead end with no prospects." 1931, the number of in-patients was 598, a reduction of owing to the hospital having been partially closed for rep and decoration. The Malmesbury Cottage Hospital a Maternity Home (30 beds) is to omit the word "cottag because, "in view of the status the hospital has acquir the committee consider that the prefix is rather a misnome There were 370 in-patients last year, the largest numb yet admitted.

pulmonary suppuration was not always acute in onset, nor always markedly febrile. In chronic abscess, especially after rupture, the fever was often irregular; a copious discharge of pus was often succeeded by an apyrexial stage. This usually indicated an abscess opened into a bronchus but not draining effectively, with periodic retention and partial evacuation. An early symptom often noted by the patient was an unpleasant taste or a sensation of foul gas about the breath; this sometimes preceded actual rupture by several days. In gangrene the discharge was extremely foul, and masses of necrotic lung tissue might be found in it. Hæmoptysis occurred in about 70 per cent. of the cases and, especially in gangrene, might be so profuse as to be fatal. Pain was usual, and sometimes was severe; in chronic cases the dyspnœa might be slight. Sometimes lung abscess developed without either rigors or profuse sweats. Often the physical signs were slight and equivocal; before a superficial abscess ruptured there might be dullness with weak breath sounds and perhaps a few râles because of congested lung tissue around. In chronic abscess clubbing of fingers might develop in as short a time as eight weeks.

Radiological evidence was very valuable; it was sometimes conclusive, and it helped to localise the abscess. When surgery was likely to be invoked radiograms taken in different positions were indispensable. After rupture the appearance of a fluid level in the cavity was diagnostically helpful; hence a radiogram with the patient erect should always be taken. Lipiodol he found useful in excluding other conditions; usually lipiodol did not enter the abscess cavity, for the entering bronchus was, in most cases, obstructed. Almost invariably the blood of these patients showed leucocytosis up to 20,000 or 30,000, with a relative polymorphonuclear increase. When rupture took place the discharge was almost pure pus; elastic tissue was almost always present. Exploratory puncture being dangerous, should not be employed, for it might lead to a widespread infection of the pleura and of the needle-tract, or might precipitate rupture into a bronchus.

Treatment should be medical in acute cases, at least until the suppurative process was localised. With medical attention a proportion of patients—variously stated at from 10 to 30 per cent.—recovered completely after rupture. When rupture occurred, the patient should be turned to the affected side; otherwise, with large abscesses, there was risk of suffocation. Postural drainage was of great value, and if the patient's condition permitted, he should hang over the bed at least twice daily to encourage evacuation by coughing. When cases were almost afebrile a creosote vapour-bath could be given. Organic arsenical compounds could be given in gangrenous cases and those with fœtid sputum.

Dr. Young concluded by stating his views on the surgical aspect. He remarked that he considered artificial pneumothorax dangerous and undesirable; frequently, however, phrenic avulsion was of value. Lobectomy might be a method of choice.

SURGICAL TREATMENT.

Mr. J. B. HUNTER dealt only with single abscess, and only such as occurred without dilatation of bronchi. Lung abscess was more common, in his view, than was generally recognised. There was a form of small abscess, usually in the upper lobe, which was completely evacuated after violent coughing, and was cured spontaneously without its presence having been suspected. Men had this condition more than women, and it was commoner in the right than in the left lung. The character of the abscess depended much on the patient's resistance, the virulence of the organisms, and the position of the abscess. The closed type of abscess needed surgery much more than did the acute type which was draining into a bronchus. The onset was usually abrupt, and might be heralded by rigors, or by less severe fever and milder malaise. In the acute stage blood was present in the sputum, altered in character, and the sputum was frothy. Radiological appearances were very helpful; a shadow could be seen in the affected lobe, circular in shape, with a fuzzy outline. Usually there was a clear area between it and the mediastinum. In rare cases the fluid level could be seen. Diagnostic needling of the lung should not be carried out, as one could not know whether pleural adhesions were present. A considerable number of patients got well with expectant treatment, mostly those with abscess of the upper lobe, the difficult site to deal with surgically.

Mr. Hunter held that the choice of the anæsthetic was very important; the lung was already damaged, and a large abscess might burst into a bronchus during manipulation and drown the patient. Some non-irritating anæsthetic should be used; his own preference was for gas and oxygen preceded by avertin. When bronchial fistula occurred it was due to inadequate collapse of the chest wall at the time of operation. Two further possible complications, even in the absence of any operation, were secondary bronchiectasis and abscess of the brain. His view was that many lung abscesses were due to a combination of embolism and the use of a volatile anæsthetic.

Dr. JAMES MAXWELL said that gangrene of the lung was the result, mainly, of a necrotic process, due to interference of the blood-supply. Lung abscess was a not uncommon sequel of lobar or bronchopneumonia, and the aspiration of septic material was probably the second most frequent cause. If adequate drainage could be established, the tendency was always towards healing; hence, at first, the treatment should be expectant. Often bronchoscopic drainage was useful. As a rule, artificial pneumothorax should not be attempted, and surgery should be reserved for cases which had become chronic; certainly it should be employed if no improvement was manifest at the end of ten weeks.

RADIOGRAPHY AND BRONCHOSCOPY.

Dr. PETER KERLEY considered abscess of the lung to be a comparatively rare disease, and it was of paramount importance to determine the mode of infection; the picture was only slightly altered according to the nature of the infection. In about 5 per cent. of cases more than one abscess was present in the lung. The radiographic findings constituted a good guide to the best treatment and to the prognosis, and X ray pictures should be taken at intervals. A lipiodol injection should always be made. The differential diagnosis could be very difficult; in some cases it could only be made by a correlation of the clinical and the radiological findings. Though a rare factor, syphilis should always be borne in mind.

Mr. V. E. NEGUS spoke as a laryngologist in favour of the bronchoscopic diagnosis and treatment of lung abscess. It was his view that every case of even suspected lung abscess should have such an examination carried out; before this was done it was impossible to say which cases would be improved or cured, and no harm could follow the skilful use of the bronchoscope. Only local anæsthesia was needed. Parenchymatous abscesses did not communicate with

TREATMENT OF PARALYSIS.

Mr. E. S. Brentnall spoke of the treatment of the disease once paralysis had appeared. The last few years, he said, had seen little distinct advance in the measures available for combating the results of severe paralysis, but they had witnessed the thoughtful evaluation of existing methods. It was also not to be forgotten that a much more adequate accommodation in country hospitals had become available in the last few years for the treatment of paralysis throughout its acute and convalescent stages, with additional provision for its subsequent after-care near the patient's home. Complete rest, with muscular relaxation and support, in a full length plaster-of-Paris bed was the most effective and simple means for dealing with the acute stage, and gave adequate protection against almost all deformity. Among the various physical measures appliable when the tenderness had gone, unloaded re-education was of overwhelming importance. The support of the affected muscles was only to be discarded when tentative freedom produced no interruption or impairment of recovery. As to the time for allowing weight-bearing, Lovett had shown that that was a most critical question for the patient with lower limb paralysis, and still more when spinal or abdominal weakness existed. Operative treatment was required in many cases to supplement conservative measures. The stretching of contractures by traction or by a series of corrective plasters was mentioned as being not only a now more popular, but a more rational procedure than sudden correction by division of the tight structures, though at times the rapid method was inevitable. Still later, operative treatment became necessary in order to improve the voluntary control at certain points, or otherwise to give stability and balance. Little progress seemed to have been made of late years in the treatment of paralysis of the upper limb. In a restricted field, tendon transplantation had proved of very considerable value, particularly in the case of the hand, but it appeared to have failed, or almost so, at the elbow and shoulder. In the lower limb tendon transplantation in general was disappointing as an isolated means of controlling paralysis.

Mr. Robert Ollerenshaw demonstrated, by photographs and radiograms, his technique in transplantation of the long extensor tendons of the toes in cases of pes cavus, a method which he considered much superior to the other methods in common use. He also showed radiograms of the operation of stabilisation of the foot combined with a posterior "bone-stop," as advocated by Campbell, and pointed out its great value in cases of "dangle foot" which had an active quadriceps extensor.

Mr. S. M. Milner drew attention to what, in his opinion, should be one of the aims of treatment in infantile paralysis—namely, the elimination of splints. Much could be done by surgery to stabilise flail joints; spinal fusion as carried out by Hibbs has much to recommend it, as eliminating a heavy spinal support. In the foot astragalectomy was advised as carried out by Whitman in the cases for which it was suggested (calcaneo-valgus deformity).

Dr. D. Sage Sutherland referred to a case in which paralysis was present which had been successfully treated with horse serum.

Dr. F. R. Ferguson asked whether convalescent human serum or any form of potent serum was available in England for use in the event of an outbreak of poliomyelitis. He also wondered in how many cases Dr. Fairbrother had been able to test the value of this immune horse serum.

The President asked on what evidence Dr. Fairbrother based his view that the spread of the virus took place by the motor pathway, and how the virus reached, as it undoubtedly did, the posterior root ganglia?

Dr. Fairbrother in reply said that unfortunately there was no organisation in this country which maintained a supply of immune serum. Only a few cases had been treated in this country with immune horse serum, but in each instance marked improvement was observed. The number, however, was too small to be of any practical importance.

ROYAL SOCIETY OF MEDICINE.

SECTIONS OF MEDICINE AND SURGERY.

On Feb. 3rd, with Dr. H. Morley Fletcher President of the Section of Medicine, in the chair these sections joined in a discussion on the diagnosi and treatment of

Abscess of the Lung.

Dr. R. A. Young said that improved diagnosi showed abscess of lung to be more common that wa formerly supposed. It might arise in one of severa ways, and it was important to determine the manne in which the suppurative process involved the lun tissue, for this would greatly influence the line c treatment. The condition might follow inhalatio of foreign bodies or of infective material into bronch especially during nose and throat operation and was then usually localised in the upper lob Secondly, it might originate in the lung parenchym from what was often called pneumonitis. A thir form was embolic abscess, which was usually multip and occurred in septicæmia, especially right-side infective endocarditis, and as a result of such remot processes as otitis, appendicitis, and infective thromb phlebitis. There were, fourthly, abscesses fro extension of suppurative processes from mediastinu bronchi, abdominal organs, or vertebræ. Agai lung abscess might result from the breakdown new growth or from necrotic changes in adjace lung tissue caused by an obstructed vascular suppl These abscesses, constituting about 10 per cent. the whole, were often in unusual situations and so we a common source of confusion in diagnosis. Finall lung abscess might result from perforation of che wall, involving fracture of ribs. Gangrene of lu occurred under conditions in which the infecti agent was especially virulent, or the patient w debilitated.

Abscess was most often simulated by interlob empyema. Bronchiectasis might cause difficulty, b lipiodol usually established its presence. New grow was difficult to exclude, and might coexist wi abscess. Radiography with the use of lipiod sometimes combined with bronchoscopy, might gi the necessary clue. The history, in its suggestio of the cause, was very important; suspicion abscess should always be aroused if there we fulminating pulmonary symptoms after operations o the nose and throat, or after a foreign body had bee inhaled, or if there was increasing fever and expector tion of pus in cases of delayed resolution followin pneumonia. Pulmonary symptoms during the cours of malignant endocarditis, or in septicæmic or pyæmi conditions, might indicate abscess formation. Bu at the end of November. No disease entailed a larger pecuniary loss by absence from work and decreased efficiency. Colds were least common at the two extremes of age. An investigation of students at Cornell University had suggested that the general physique and physical defects in cold-susceptibles were much the same as in others, and that cold-susceptible students gave a history of more infectious disease, asthma, and hay-fever than did normals. The report gave no support to many treasured ætiological fetishes.

The possible ætiological factors were atmospheric causes, cold, disturbance of metabolism, and infection. The French believed strongly in cold as a cause of colds, but Arctic explorers and other people exposed to cold disproved this theory. V. S. Cheney regarded a cold as a mild acidosis, and denied that it was infectious at all. The speaker was glad that treatment was not standardised, for every man got his cold in his own way, according to his general and local predisposition. Every case began as an acute sinusitis, and should be treated at once by rest in bed for 36 hours to three days, with warmth to the head, and wide open windows, the avoidance of all lotions and sprays, but the use of simple inhalations. Drugs should only be used to relieve symptoms—the relief given by salicin and similar preparations was well known. When the discharge became purulent, simple saline lavage was indicated.

Colds were unknown in sanatoriums, but inmates of these institutions were more liable than other people to peculiarly severe colds as soon as they returned to normal life. Light treatment and vitamins had been tried in America and proved to have no effect.

The cold was one of the penalties paid for civilisation, and might be a device of nature to vaccinate us against more serious evils.

BACTERIOLOGY OF THE COLD.

Dr. **John Freeman** said that bacterial infection could be proved in all colds, the causal agents being pneumococci, streptococci, Pfeiffer's bacilli, diphtheroid bacilli, Friedländer's bacilli, micrococci, and staphylococci. These occurred in little epidemics throughout the catarrhal season. In the later stages of a cold the mouth showed an overwhelming growth of one or perhaps two organisms; in the early stages the watery discharge might be free from bacteria. The infections were so multiple that many attempts had been made to find an earlier primary infection; Dochez had gone near—if he had not reached—proof of a filtrable virus. The differential diagnosis of catarrhal conditions was still in a very early stage of development. Until the mechanism of a disease was known, its clinical classification must be provisional. The common cold was undoubtedly an infection.

In Dochez's experiments the virus seemed to differ from that of influenza, and to protect the chimpanzee for about three months. It incited the growth of bacteria living in the mouth at the time. We did not yet know whether the virus caused all colds, whether it was single or multiple; whether it was alive or a ferment. By itself it seemed to be trivial as a pathogenic agent; it was the secondary bacteria that did the damage and caused the danger. Therefore therapeutic policy at present was directed against the bacteria. Any antiseptic strong enough to harm the bacteria would damage the nasal passages; mild douches deprived the patient of the natural defences of his nasal discharge. Room-spraying was a psychological treatment. Dochez's experiments had shown that his volunteers were very apt to develop colds when they thought they ought to.

Vaccines seemed eminently the treatment of choice. A big enough dose must be given for prophylaxis, and this dose in the middle of the catarrhal season was likely to produce a cold. The dose must therefore either be given before the season or must be built up slowly. Septic foci meant carrying infection, and should be dealt with by vaccine therapy for the sake of the patient and of his neighbours.

DISCUSSION.

Dr. **Dan Mackenzie** said that the common cold lay at the back of most of the inflammatory conditions that the oto-rhino-laryngologist had to fight. The whole subject was vague. The key to the position from the epidemiological point of view was probably the carrier; the carrier might, however, have no obvious disease between attacks. His experience of vaccines had been disappointing, and he was convinced that "hardening" treatment was fundamentally wrong for the carrier. He doubted whether the open window was the right thing for him either. The cause of adenoids was unknown, but children naturally curled up under the bedclothes; Sim Wallace had asked whether cold might not be the cause of adenoids in the English child. For curative purposes, ♏ 5 of collosol iodine in a glass of water had proved empirically very successful in colds.

Dr. **P. Watson-Williams** distinguished between common colds and the chronic or established catarrhs, the sequelæ of acute catarrhs that did not end in recovery. In many families a parent was the perpetual source of infection, the infectivity being obscured by acquired immunity. Various anatomical defects played a part in establishing chronic catarrh. The symbiosis of infecting organisms also played a part in increasing virulence beyond normal resistance. While the ordinary common cold might be treated by the physician, the subjects of chronic catarrh and asthma should be investigated by the laryngologist. The best abortive remedy in colds was a massive dose of the hydrobromate of quinine—grs. 12–20; such remedies 24 hours too late, however, did more harm than good.

Mr. **Herbert Tilley** pointed out that the sinuses were always involved in the common cold; later the infective process tended to become localised, and discharge might be pent up. Neuralgia in the course of an acute cold was nearly always due to sinus infection; the diagnosis was confirmed by finding the middle meatus blocked by œdematous mucous membrane. A little cocaine and adrenalin placed in the region for three or four minutes and applied again three or four hours later would stop the process of obstruction. If the treatment could not be repeated, the area should be scarified when first seen. Middle-ear infection was one of the dangerous sequelæ of the cold. A dose of calomel, followed by a saline, and measures for local relief of pain (glycerin and boric acid or opium), with incision of the drum, was usually successful. The speaker advocated puncturing the drum as soon as it was inflamed, and not waiting for bulging, when it might be too late.

Dr. **Bedford Russell** recommended cocaine to reduce the swelling of the mucosa as a preventive measure against sinusitis.

Sir **Thomas Horder** briefly replied.

a bronchus. A suction tube could be passed through the bronchoscope into different bronchi, to see if it would strike pus. If the search was negative, the case was unsuitable for bronchoscopy. In another type the abscess communicated with a bronchus, the latter being plugged, so that drainage was impossible. The bronchoscope was useful here, but its use should not be continued unless definite improvement was evident. In another type the patient was coughing up pus, but not freely. He referred to a patient who had had a chronic lung abscess for 12 years. He had had eight cases of lung abscess due to the inspiration of a foreign body, and in all of them removal of the foreign body brought about cure.

Dr. L. S. T. **Burrell** referred briefly to lung abscess following operations on nose, throat, and teeth. There were four methods available: (1) to leave the patient alone, (2) to treat with a bronchoscope, (3) to drain surgically, (4) to induce pneumothorax. Looking through his cases he was impressed with the seriousness of lung abscess, and how impossible it was to advocate one method of dealing with all the cases. Bronchoscopy should not be done in cases where there was a foreign body. He was appalled by the number of people with lung abscess who appeared to do well but eventually died. Surgery, he thought, had not yielded the results which were expected of it. And the induction of pneumothorax he regarded as extremely dangerous in the case of superficial abscess. The safest treatment for an abscess which was central he believed to be collapse at an early stage.

Mr. A. **Tudor Edwards** emphasised the fact that there were two types of symptoms in abscess of lung. There was a type in which the discharge from the abscess was continuous, and that was often confused with bronchiectasis. There were two types of effusion secondary to pulmonary abscess: one was the chronic, slow-forming localised empyema; these did very well. A different condition was that in which fluid collected in a large pleural cavity with almost no adhesions. Cerebral abscess did occur in relation to undrained lung abscess. He was becoming more convinced that drainage in these cases should be done in two stages; in the first, an adequate amount of lung tissue should be taken away, and in the second he used diathermy of lung with a button electrode. This latter prevented the projection of emboli into the circulation, for the vessels were sealed by the diathermy.

SECTION OF LARYNGOLOGY.

A MEETING of this section on Feb. 5th, with Mr. W. G. **Howarth**, the President, in the chair, was devoted to a discussion on

Common Colds and their Sequelæ.

Sir **Thomas Horder** defined a cold negatively as not paroxysmal rhinorrhœa or sneezing, hay-fever, acute naso-pharyngitis preceding an acute disease, nor even acute coryza, though to the layman these things were all "colds." A bout of sneezing might do the sufferer good by clearing the nasal passages. The common cold might be defined as an acute specific catarrh involving the upper respiratory tract, running a benign course for two or three days, with pyrexia and other constitutional symptoms, and protecting the patient for a short time only. Probably there was a specific infection due to a filtrable virus, associated with secondary infections by catarrhal organisms. The term "feverish cold" was justified by the inadequacy of clinical and bacteriological knowledge. The fewer organisms that could be demonstrated, the more safely the common cold could be diagnosed. Rhinitis, sinusitis, Eustachian catarrh, and pharyngitis all occurred in the type case, but individuals varied in the anatomical distribution of the infection. The disease might be trivial or devastating, and the toxæmia might be deep. There were also abortive cases. There was no evidence that the infection known as the common cold ever expressed itself as a chronic catarrh. Among the alleged predisposing causes were heredity, rheumatism, and gout, but these were very doubtful. The seasonal and age incidence were recognised. Exciting causes did not include mere cold or mere heat, but rapid changes in temperature might aid the specific materies morbi, which was probably a filtrable virus. The nearest solution to the difficult diagnostic problem presented was a careful clinical investigation.

Prophylaxis included general methods of preventing lowered resistance and cleaning the atmosphere; local disinfection, isolation, and inoculation. The belief that a "fit" and hard person was less liable to colds had much against it; many people developed colds on return from a holiday. Fitness did not protect against the primary infection, though it did help the patient with the secondary infections. Everyone would agree that physiological breathing should be taught, and unhealthy conditions of the nose and pharynx corrected, but there was no agreement on the best local prophylactic measure, and no evidence to support any one method. Isolation was important, but unfortunately the equally infectious mild case went free. Inoculation could only be empirical until the causal agent had been isolated. Curative treatment should begin at the earliest possible moment, and in many cases the cold could be aborted by a hot bath, copious hot drinks, a smart purge, a warm bed, and opium. After these, the subsequent treatment did not greatly matter, but the patient's faith in any given remedy should not be scouted. As the disease progressed, the treatment of the patient became more important and the treatment of the nose less important. Time alone could show the value of the numerous specific remedies now on the market. It was the duty of the profession—and of those who pressed these remedies on it—to maintain a healthy scepticism, and to promote research.

A LARYNGOLOGIST'S VIEW.

Sir **StClair Thomson** said that his researches in collaboration with Prof. R. T. Hewlett, 37 year ago, had stood the test of time. They had demonstrated that the ciliated epithelium of the nose filtered off as many as 14,000 organisms in one hour's quiet breathing. The common cold was an infectious disease, and might be apostrophised in the words of Matthew Arnold:—

> "Others abide our question. Thou art free.
> We ask and ask. Thou smilest and art still,
> Out-topping knowledge."

As had been wittily said, the common cold lasted a fortnight, but if treated it only lasted 14 days. It might be defined as an acute or subacute catarrha affection, commencing in the nose or post-nasa space, generally invading the sinuses and sometimes spreading to the Eustachian tubes, pharynx, larynx or further. Its greatest frequency was in the latter part of January, declining thence to the latter half of June, increasing sharply at the end of July, to reach a peak at the end of September, and another welcomed the search for a classification that, while not a mere pigeon-holing, endeavoured to study the actual causal factors determining reaction types.

Dr. David Forsyth said that he had never been able to regard the oral-libidinal as necessarily preceding in time the anal-libidinal primary; the child must experience both from the very beginning of life. The "oral" child became a much pleasanter, more educable and extraverted type of child than the "anal" type. It was a matter of very great importance which zone came to occupy the child's chief interest.

Dr. Margaret Lowenfeld asked whether any research had been done in relating later developments with early life-histories in this connexion: for instance, the subsequent fate of children who had at first refused to suck, thus throwing great stress on the anal experience, and the relation of subsequent speech defects to oral impulses in the earliest days.

Dr. Henry Yellowlees said that Dr. Glover's views dealt a death-blow to the belief that neuroses were in any sense halfway houses to the psychoses. The objection to this classification was that no case could be assigned to its class without elaborate investigation; it did not help the clinical worker.

Mrs. Melanie Klein said that the effect of a good sucking stage could be observed to influence the subsequent development, modifying the sadistic impulses.

Dr. Glover, in reply, pointed out that the primacies were cross-sectional views, and at each cross-section one interest would be found predominating. In longitudinal section they would be found overlapping, and one influenced another, the anal being largely conditioned by frustration of the oral, for instance. He thought his scheme, while appearing at first sight impracticable, might lead to much combined research between clinicians and psychoanalysts. Psychiatrists had got off too easily in the past; their classification compared with the stage of organic medicine in which diseases were classified by the region in which symptoms appeared—the head, the leg, the belly, and so on. The physician did not find the modern complex classification impracticable, because he had got used to it.

MEDICAL SOCIETY OF LONDON.

Mr. Herbert Tilley took the chair at a meeting of this society on Feb. 8th, and Mr. Harold Dodd opened a discussion on the

Toxic Syndrome of Chronic Cholecystitis.

He said that the condition was more common than was generally realised, and that it formed an appreciable proportion of the obscure conditions classified by Mackenzie under the two headings of diseases recognised by a single symptom and diseases with uncoördinated symptoms. The incidence favoured women in the proportion of two to one. He differentiated sharply between chronic cholecystitis and gall-stones, which were often a late sequela. Many of the ailments in the syndrome might appear to be quite unrelated, like the parts in a jig-saw puzzle. The family history sometimes showed near relatives suffering from similar conditions. The trouble could often be dated from the birth of a child, a severe febrile disease, or a long history of bilious attacks, sometimes dating from infancy. In some cases there was a history of maternal ill-health during pregnancy. Jaundice occasionally occurred.

Unpleasant changes in the sleep were constant; all the patients were nervous and dreadfully miserable. Neurasthenia was prominent and especially common in single business women of about 30. Irritability and giddiness were general. The headache was characteristic, usually across and deep behind the eyes, sometimes in the occipital area or nape, or in the frontal region towards the vertex. Breathlessness was often prominent, occurring after exertion and food and in the night. It was sometimes associated with sensations of suffocation or a deep aching pain in the upper part of the right chest. Some cases of asthma were relieved by a gall-bladder operation. Pain, discomfort, and catches in the breath at the right costal margin and the right lower intercostal spaces were frequent and might be the chief symptoms. Palpitation and thumping of the heart were common and might be accompanied by pain about the heart. Patients of any age or sex might have cold shivers or hot flushes, and all were very susceptible to changes of temperature.

Among the alimentary symptoms were capriciousness of appetite and nausea. Patients could not take fatty or acid food, and ultimately reached a stage when bread and butter and boiled fish were the only foods which did not provoke severe indigestion. Many complained of a dry mouth with a nasty taste, which might lead to air-swallowing. Soon after taking food, discomfort grading to severe pain occurred in the epigastrium; at first only after the chief meal of the day, but later after every meal. Flatulence was outstanding and distressing in all stages of the disease. Some patients had hæmatemesis. Periods of freedom from pain gradually became shorter until there might be daily discomfort and two or three attacks of pain in a fortnight. The pain occurred one to three hours after food and might awaken the patient at night. It was sometimes associated with a small duodenal ulcer, always situated on the anterior wall half an inch from the pylorus. Constipation was usual. Scalding and sometimes frequency of micturition occurred on and off. Rheumatism and neuritis were common complaints, occurring in all parts of the body. The general strength was usually much lessened and, in the later stages, loss of weight was the rule. Occasionally the thyroid was symmetrically enlarged, less often irregularly. Symptoms increased at the menstrual period in a considerable number of patients.

The physical signs included an appearance of tiredness and anxiety. The eyes were distinctive: they appeared watery, with muddy sclerotics and slight injection of the conjunctival muscles. Moskowicz's sign—dilatation of the right pupil when the eye is at rest—occurred fairly often. The skin was usually of a greyish-bronze or sallow colour. Hyperæsthesia was present in 75 per cent. of patients, and tests for it helped to localise the site of the toxic focus; it was usually over the right half of the abdomen, occasionally in the right iliac fossa, and, in the back, below the angle of the right scapula to the crest of the ilium. Boas's sign was reliable: tenderness on pressure over the right costo-vertebral angle; sometimes this pressure evoked also the ordinary pain and flatulence. The tension of the back muscles between the twelfth ribs and iliac crests was often unequal. There was usually tenderness over the gall-bladder area, in the right rectus and in the right iliac fossa; often also in the left iliac fossa, probably due to spastic colon. Piles were

SECTION OF PSYCHIATRY.

AT a meeting of this section on Feb. 9th, the chair was taken by Dr. BERNARD HART, the President, and a paper on the

Principles of Psychiatric Classification

was read by Dr. EDWARD GLOVER.

The psycho-analytic worker, he said, could not postpone for ever the task of correlating his formulations with psychiatric classifications. Psycho-analysis looked forward to an increasingly close alliance with pure psychiatry. Almost all thoughtful text-books drew attention to the difficulties and confusion of existing classifications—which gave an impression of matted complexity, a complexity which was in inverse ratio to the fundamental understanding achieved. An adequate system should be elastic enough to allow modification and indicate the possibilities of future research. It should present existing data in as comprehensible a light as possible, but should not force explanations on little-understood problems. A purely descriptive method was dangerous and retrogressive; it was unlikely to be either accurate or complete in view of the existence of unconscious elements. In the absence of general agreement on ætiology, however, a descriptive factor seemed inevitable, at any rate temporarily. To it could be added other factors which would amplify it and—most important—relate the phenomena of psychiatry to normal development. A sound classification must be built up in close relation to the development of the ego structure, and in particular to that phase during which the regulation of instinctual tendencies swung between the great primitive mechanisms of introjection and projection. This second factor must be supplemented by a third—a specific factor that would distinguish what the man in the street meant by madness—the psychoses—from other psycho-pathological phenomena. The closest approximation to a specific factor was loss of sense of reality—a disturbance of ego-object relation.

The speaker took three groups under his descriptive factor: a schizophrenic group characterised by withdrawal from reality, a depressive group, and a delusional group. The function of the ego was to effect a compromise between the demands of instinct and the possibilities of reality. The signal system by which the ego tested the success or failure of its manœuvres was anxiety. Anxiety was the alpha and guilt the omega of human development. The three possible manœuvres were sublimation or repression of the demands; lessened demands with some tolerance of frustration; and distortion of the ego. To the third group belonged the psychoses and neuroses. The ego, however well organised, was essentially a composite, even in a young child; from at any rate one year onward the ego was polynuclear. The earliest ego tendencies were derived from scattered instinctual elements, and gradually converged. The elements of the first primitive nucleus included all the erotogenic zones, together with all the aggresive centres, as well as the oral libidinal system. The fixation point of melancholia was oral; it would ere long be possible to determine the fixation points of schizophrenia. The last organised fixation points represented the neuroses. There was a great field for research here.

LOSS OF REALITY—PROVING.

There was much scope for confusion about the boundary between the ego and the object, since in auto-erotic phenomena the object was part of the subject's own body. An instinct that could be satisfi in the subject's own body was to some extent manag able; one that required a separate object was mo difficult to master and was more likely to cause t psychic pain of frustration. Some colics could relieved by expelling wind or ejecting a crumb i.e., a "me" pain could be converted into a "not me Here was the basis of the projection phenome of paranoid states. The ego would be much saf from anxiety if it could convert pleasurable "no me's" into "me's"; if the desired object could introjected into the ego. This was the basis of t introjection mechanisms seen in schizophreni Inside the ego were the "pins" and "crumbs of frustrated instinct, complicating the processe When the pleasurable object was found to be n really a part of the ego, but only occasionally availabl it became hateful; but to destroy it would be "kill the goose that laid the golden eggs." Henc there was serious tension. The child struck th bars of its cot and at the same moment the ba "struck back" hurting the child—here was the ger of persecutory ideas. Introjection was a mechanis for dealing with disappearing objects; whether th child loved or hated an object, the object was bes dealt with if it could be got inside. Unfortunately, th result was often to get the ego's own head "i chancery" instead of the object. Hate raged agains hate—the seeds of melancholia.

The mechanism of repression broke the viciou circle by sacrificing the primitive instinct; thi process was the development of the super-ego. Th child longed for a real reality, free from the terrifyin results of projection. The function of parents wa to provide a reassuring reality in this phase. Th normal infant was in an acute psychosis and woul continue in a state of anxiety unless it could come t terms with reality. If, in later life, repression brok down he would be plunged back into infantile anxiety The potential psychotic was one who had a precariou adaptation to reality. Adult reality sense represente the capacity to maintain contact with objects, th objects through which infantile instincts were gratifie and all possible substitutes. Society was not to exacting in its demands so long as a man did no try to kill his introjected enemies by suicide or hi projected ones by homicide.

The main psychoses and neuroses could be classified by ego relations with objects quite simply in children, but in adults the classification would have to include certain character-states and formations not usually grouped with psychoses and neuroses. Introjective oral phases were linked with dementia præcox and melancholia; anal phases with obsessional states, and genital phases with hysteria and psycho-sexual inhibition. The projective oral phases were linked with the schizoid and paranoid group, the anal phase with drug addictions and compulsive character groups, and the genital phase with the anxiety character and social inferiority group. In the oral and anal phases there were essentially group fixations, not single. The schizophrenic fixation was an omnibus fixation and had components from both introjective and projective sides. Compulsive neuroses were obviously autoplastic, but some phobias had a paranoid element. Drug addictions were on the borderline between psychoses and neuroses, but on the whole, the term "borderline" was unsatisfactory, and the term "potential psychosis" was preferable.

DISCUSSION.

The CHAIRMAN said that the history of psychiatric classification was strewn with wrecks, and he

REVIEWS AND NOTICES OF BOOKS

The Laboratory in Surgical Practice.

By E. C. DODDS, M.V.O., M.D., Professor of Biochemistry, University of London ; and LIONEL E. H. WHITBY, C.V.O., M.D., M.R.C.P., D.P.H., Bacteriologist to the Middlesex Hospital. London: Constable and Co., Ltd. 1932. Pp. 187. 8*s*. 6*d*.

WE welcome this, the first of a new series under the general editorship of Gordon Taylor, because it fills a need. Hitherto if surgeons have desired to obtain information on the numerous tests employed in their work, they have had to consult the scattered literature or large technical laboratory manuals. Here, in simple language, Prof. Dodds and Dr. Whitby have described and explained the methods of performing such tests as those of renal function, blood grouping, and basal metabolism. They have ably summed up the occasions when such tests are called for and likely to give useful information, and the significance of the results that may be obtained. The sections on cholecystography and intravenous pyelography are especially useful, and those on the uses of serums, vaccines, and the bacteriophage are very informative.

We commend the book both to working surgeons and to members of laboratory staffs.

Der Mineralbestand des Körpers.

By WOLFGANG HEUBNER, Professor in Heidelberg. Berlin: Julius Springer. 1931. Pp. 94. R.M.8.50.

THE proportion of mineral constituents in the bodies of vertebrates is small in proportion to the so-called organic matter—in man it is about 4 per cent., as measured by the ash left after incineration. About a quarter of this is associated with the soft tissues and body fluids, the remainder being in the bones. Prof. Heubner's book, which is a reprint of the chapter of the same title in the " Handbuch der normalen und pathologischen Physiologie, Bd. XVI/2 " is a useful up-to-date summary of our present knowledge of the significance of the inorganic constituents of the body. In his introductory chapter he calls attention to the interesting fact that, small as is the mass of mineral constituents relative to the " organic " —e.g., the proteins—yet, owing to the enormous molecular (or micellar) weights of the organic matter (multiples of 35,000), the molar concentrations are often greater. Thus the concentration of hæmoglobin in the blood corpuscles is 0·02 molar, whilst that of chlor-ions in the plasma is 0·1 molar.

Brief sections deal with the anions and kations in the blood and other body fluids. The remarkable excess of bases over acid radicles (recognised as such) in blood which has variously been attributed to the acidic properties of proteins and the presence of unknown acids is discussed. The author says truly : ‘ Es ist von grundsätzlicher Wichtigkeit dass die Frage der Absättigung des Basenüberschusses im Blutplasma durch weitere Untersuchungen zu endgültiger Klärung gebracht wird." Sections follow on the mineral content of the blood corpuscles, of the whole blood, and of the solid tissues of the body.

It is remarkable that whilst the composition of the ash of the blood plasma of all mammals is very similar (although in amphibians more dilute than in land animals), the ash content of the corpuscles varies among different animals, and is characteristic for each kind.

Prof. Heubner alludes to the elements, such as copper, manganese, iodine, vanadium in various ascidians, which, although present in very small quantities in the fluids or tissues of the body, appear to have important functions in maintaining it in a state of health. He mentions interchangeability of certain elements—strontium will to some extent replace calcium in the bones and bromine will take the place of some of the chlorine—but refrains from a full discussion of the rôle of these interesting constituents of the body.

This concise work forms a valuable handbook for those interested in this branch of biochemistry. A copious bibliography is supplied in footnotes.

A Text-book of Exodontia.

Second edition. By LEO WINTER, D.D.S., Professor of Oral Surgery, New York University College of Dentistry. London: Henry Kimpton. 1931. Pp. 455. 42*s*.

THE term exodontia was coined in America as a substitute for the more homely expression, extraction of teeth, current in this country. Several books on this subject have been written by American dental surgeons within the last few years. This book is a fair but not outstanding specimen. It is a safe guide as far as it goes, but in spite of its length many omissions are apparent—for example, post-operative treatment, which from a practical point of view is of paramount importance. An operation such as the removal of an impacted lower third molar may be one of considerable severity. The after-pain may be great, and the success of the operation in the eyes of the patient is largely conditioned by the ability of the operator to control this pain. Very little is said by Prof. Winter on this aspect. A few drugs are recommended, but no hints are given on the value of frequent irrigation, the use of heat or cold, counter-irritation, or other devices.

In discussing the treatment of impacted upper canines the author shows a marked preference for the palatal route. Where the canine is close to the palate, as is often the case, this route is obviously indicated. But when a canine involves the antrum or the nasal fossa, there is much to be said for using the alveolar path. In connexion with the treatment of infected lower third molars, infiltration injection is rightly condemned on the grounds that the injection would necessarily be made into an infected area. We cannot, however, agree with the advice to use conduction anæsthesia, for the needle would have to be inserted close to the inflamed area, and though less the risk of infection would still exist; a general anæsthetic avoids this danger. No mention is made of the removal of the upper third molar as a speedy means of relieving the pain from an infected lower third molar. This is not always effective, but in many cases much of the pain is due to the fact that the upper molar bites on the inflamed and thickened pad of gum overlying the lower molar. The extraction of the upper tooth is a simple matter and may relieve the pain so as to enable removal of the lower molar to be delayed until the inflammation has subsided. We note with interest that Prof. Winter regards the removal of a lower second molar as a common. A positive radiogram was not necessary. The barium meal might show a change in gastric tone or emptying rate, an irritable duodenum and occasionally a pathological appendix. In time early cases might be treated medically, but at present operation was confidently advised. Improvement began immediately, and convalescence lasted for 6 to 12 months with occasional slight relapses. A holiday was very desirable, and sedatives and vitamin-containing preparations should be prescribed.

Mr. Dodd described the anatomy and neurology of the gall-bladder, and also the appearance of a diseased gall-bladder on the operating table.

THE PATHOLOGICAL ASPECT.

Dr. Arthur Davies said that most specimens showed definite histological signs of medical cholecystitis: the mucosa was œdematous and the wall was infiltrated with lymphocytes, histiocytes, plasma cells, and young fibroblasts, and there were inflammatory changes in the subserous layer. His impression was that in the majority the route of infection had been the blood stream. The specimens showed sinuses formed by the pouching of the mucosa into the muscular tissue; in one case small gall-stones were found in the interstitial substance. In 12 per cent. there were definite indications of strawberry gall-bladder. In a number there was no evidence of histological change; he believed that in some gall-bladders change of function must occur without change of structure.

Dr. Charles Miller said that the gall-bladder might be blamed for certain cases of urticaria, asthma, migraine, and gall-bladder dyspepsia. There was a constant difficulty in determining the relationship between pain produced by the gall-bladder and pain produced by the heart—between angina pectoris and gall-bladder colic. The quality of the pain might be almost identical, and the similarity might be due to an origin in the same region of the central nervous system. From a study he had made of the post-mortem records of 350 patients at the London Hospital with gall-stones or cholecystitis, he had found an excess and earlier incidence of atheroma in patients with gall-bladder disease. Chronic gall-bladder disorder might therefore produce especially severe cardiac symptoms in a middle-aged heart that was more degenerated than it should be, and these symptoms might be relieved by cholecystectomy.

THE RADIOLOGICAL ASPECT.

Dr. G. E. Vilvandré stated that in careful hands with proper technique at least 70 per cent. of gall-stones could be shown by the radiologist. The dye test might fail to reveal a pathological gall-bladder, but a visible gall-bladder, whether it had stones or not, was pathological. Negative radiological evidence was worth nothing. A good clinical history was a valuable aid to the finding of gall-stones. Investigation of the gall-bladder should be an essential part of every routine gastro-intestinal examination.

Dr. J. R. Wylie described his radiological research into early duodenal ulcer before the appearance of deformity; these "observation" cases might present a difficulty of diagnosis from cholecystitis. This class of case had no ulcer crater, but a regular peristaltic action in the first stage of the duodenum, with considerable tenderness. The peristalsis had until recently been put down to a reflex action from the appendix or an inflamed gall-bladder, but the speaker thought that there might be a typical local lesion in the duodenum. The only reflex action that he could associate with the gall-bladder was a pyloric spasm.

Mr. Zachary Cope suggested that Mr. Dodd's jig-saw puzzle could be put together to form several alternative pictures. There was probably no one present who had not had one part of the syndrome, but if all the syndrome had to be present, then probably no one had it. He asked for a more precise definition of the syndrome. It was very difficult to associate this syndrome with serious demonstrable organic disease of the gall-bladder. The syndrome was seen in the neurasthenic type, which Mr. Dodd had put down as neurotic—a very dangerous generalisation. The same symptoms had been attributed to chronic intestinal stasis. The essential point of criticism was that in many cases with the symptoms described the liver was at fault. Many patients relapsed some months after operation. Mr. Cop said that he would have been more convinced if h could have known the state of the liver of Mr. Dodd' patients, and the state of the patients five years ago

Mr. A. J. Walton urged the necessity for grea care. It was now becoming fashionable to remov the gall-bladder, as it had formerly been to remov the appendix or fix the colon. He believed that large number of cases with the syndrome Mr. Dod had described were obscure cases of hepatitis; the might be pathological cholecystitis, but were certainl not surgical cholecystitis, and were readily cured b medical means. It was necessary to strike a balanc between credulity and disbelief in the value of th cholecystogram. He would remove a gall-bladd only if it had lost its normal colour and was definitel thickened to the feel or contained gall-stones.

Dr. W. Langdon Brown asked what was th irreducible minimum of the symptoms for a positi diagnosis. He thought that many of Mr. Dodd cases could have been cured without operation, an doubted whether all had really had cholecystitis.

Dr. A. H. Douthwaite said that a large proportic of Mr. Dodd's hyposthenic type were suffering fro visceroptosis, and could be cured by exercise ar ordinary medical treatment. Cholecystitis could treated by draining the gall-bladder and abdomin exercises. He challenged Mr. Dodd to a conte between these methods and surgery. The hyposthen person was liable to angina, and the confusi between this and cholecystitis often gave rise mistaken diagnosis. Nevertheless, there were patien with angina whose gall-bladders were abnorm radiologically and who benefited by their remov probably because they were a toxic focus.

Dr. C. E. Lakin asked if the specimens had be examined bacteriologically.

Dr. Charles Newman said that the syndro fitted the gall-bladder dyskinesias, and describ recent work done on the Continent. Diagnosis w easy by duodenal intubation and the test with pituita extract and olive oil, and the medical treatment w simple and effective.

Mr. Dodd, in reply, promised a later report on t progress of the patients. He required the physic signs to be definite before he operated. On average, four to six of the groups of symptoms nervous, respiratory, cardiac, alimentary, urinar and locomotor—should be represented. He doubt Mr. Walton's assertion that many patients could treated medically. Dieting was impracticable becau the patients could hardly retain any food.

Dr. Davies replied that unfortunately no bacteri logical investigation had been done.

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means of relieving the impaction of a third molar, as malpraxis. Some dental surgeons hold with him that an impacted lower third molar must itself be removed at any cost; others tend to deal with every case of impaction by the routine removal of the second molar. The first group inflicts on the patient a long, tedious, and often painful operation, which might sometimes be avoided by the simple removal of the anterior tooth; the second group may deprive the patient of a useful tooth without removing the infected one, or eliminating a source of infection which may continue to give rise to trouble. In our view both methods of procedure have their place, according to the conditions which may be present.

The last chapter, on the removal of cysts, leaves much to be desired. Nothing is said of those cysts, not uncommon, which impinge on the antrum without opening into it. The removal of the lining membrane, as advocated by the author, would involve the antrum in these cases, and it is far better practice to leave the lining in the deeper part of the cyst intact. Provided that a sufficiently large opening has been made, there is no fear of recurrence. The closed method of operation in which the flaps are sutured after removal of the cyst is not mentioned. It cannot be carried out in all cases, but when suitable it is an excellent method. It is curious that the only section in the book devoted specifically to the treatment of post-operative pain follows this chapter. Yet after-pain is uncommon following the removal of a dental cyst, provided that free drainage has been established and that all sharp edges of bone have been smoothed away.

The book is lavishly illustrated with pictures of high quality. The various steps of different operations are clearly depicted, and the illustrations should prove of much help to the reader.

Rheumatoid Arthritis and its Treatment.

By VINCENT COATES, M.C., M.A., M.D. Cantab., M.R.C.P. Lond., Consulting Physician, Trowbridge and District Hospital; Physician, Royal Mineral Water Hospital, Bath; Cardiac Specialist to School Medical Service, Wilts County Council; and LEO DELICATI, L.M.S.S.A. Lond., Resident Medical Officer, Royal Mineral Water Hospital, Bath. London: H. K. Lewis and Co., Ltd. 1931. Pp. 114. 6s.

THE speed with which literature on the subject of rheumatism and arthritis is accumulating makes it impossible for the busy practitioner to keep pace. He will therefore be glad to know of this small book, which in 114 pages gives him useful and practical information. The Royal Mineral Water Hospital, Bath, provides a wealth of clinical material and a very fruitful field for observation, and it has been quite easy for the authors to collect 100 consecutive cases of rheumatoid arthritis, all of whom are resident in the hospital, and to investigate them along certain lines, with a view to forming an approximate idea of the frequency of clinical and biochemical syndromes. The book, which treats of this disease only from the therapeutic point of view, is arranged in sections. The opening chapter deals with the vexed problem of classification, and although the authors do not get much nearer to the solution of this problem, at least they define clearly what they themselves understand by rheumatoid arthritis. The second chapter contains a clinical description of the disease, which includes an interesting short history of the "subcutaneous nodule." Certain biochemical obliquities and their interpretation are next described, after which an account is given of systemic treatment along definite lines. This is probably the most valuable section in the book, which is concluded by descriptions of a number of instructive cases. This work does not set out to be an exhaustive treatise, but a description of principles and methods which, in the authors' hands, have been found useful in the treatment of rheumatoid arthritis. It will be appreciated both by practitioners and medical students.

Practical Physiological Chemistry.

Tenth edition. By PHILIP B. HAWK, M.S., Ph.D., President of the Food Research Laboratories, Inc., New York City; and OLAF BERGEIM, M.S., Ph.D., Associate Professor of Physiological Chemistry in the University of Illinois, College of Medicine, Chicago. London: J. and A. Churchill. 1931. Pp. 929. 30s.

THIS book was originally published in 1907, but since then such rapid strides have been made in this subject that this volume will be found to contain about five times as much material as the first volume. Many of the chapters have been entirely rewritten or revised, and the advice of other experts has been requisitioned by the authors in bringing the various sections up to date. Basal metabolism is dealt with at length, as are problems in connexion with blood, urine, and gastric analyses. The section on proteins has been considerably extended, and much space has also been devoted to a consideration of vitamins and deficiency diseases. In places where only a very brief outline of the subject is given—as, for example, in the chapter on the endocrine organs—many references have been supplied to indicate where more comprehensive information can be obtained. There are nearly 300 illustrations, which greatly add to the value of the text, and there is also a very useful appendix on reagents and solutions.

The book is already so widely known and appreciated that it is hardly necessary to praise the excellent way in which the author has managed to include so much of value and interest in a comparatively small volume.

The Surgeon.

By C. JENNINGS MARSHALL, F.R.C.S., M.S. London: Geoffrey Bles. 1932. Pp. 129. 3*s.* 6*d.*

THIS contribution to the Life and Work Series is written by a surgeon to a large teaching hospital who has therefore had every opportunity to reinforce his learning both by the clinical opportunities enjoyed and the necessity of imparting its essentials in simple terms to students. Here the students are the public, and the information to be given is not concerned with the practice of surgery (which must be the surgeon's job and only surgeons can appraise it) but with the relations that surgery bears to those who are to benefit by its practice. Mr. Marshall's brief exposition of the training required to make a surgeon and of the meaning of surgery; his analysis of the situations when operation should be advised; his remarks upon ethics and orthodoxy; and his historical deductions make up a small book that will be read with advantage by all men and women who wish to understand the problems, the difficulties, and the successes of modern surgery.

THE LANCET.

LONDON: SATURDAY, FEBRUARY 13, 1932.

BCG AND LÜBECK.

The long drawn out trial of Dr. Georg Deycke and his colleagues at Lübeck in connexion with the Calmette-Guérin vaccine has at last reached its end—an end which is tragic for Prof. Deycke who, now no longer young in years, has spent a lifetime in disinterested service to bacteriology. The events which led up to the trial can be summed up in a few words. During the winter of 1930–31 253 infants in Lübeck were given by the mouth B C G vaccine subcultured from cultures received from the Pasteur Institute in Paris; within some three months 68 had died of acute tuberculosis, and doubts arose as to the nature of the vaccine. Broadly speaking, there were two possibilities. Had B C G, a non-virulent bovine strain of tubercle bacillus, suddenly acquired virulence, or had another strain of tubercle bacillus accidentally gained access to the vaccine? After exhaustive investigations the German courts have decided that the latter is the explanation, thereby vindicating the reputation for non-virulence of B C G, but involving Prof. Deycke in the responsibility, which as head of the laboratory he must accept, for the accidental admixture of virulent cultures with the vaccine. The final stage in the trial is reported by our Berlin correspondent on p. 365 of our present issue.

The questions raised by this calamity are no mere academic quibbles. The B C G vaccine has been broadcast so extensively that any bacteriologist, and indeed any clinician, may find himself suddenly confronted with the decision, whether or not he should recommend its use. We need not recount all the stages in the development of B C G by Calmette and his co-workers at the Pasteur Institute. They have been set out diligently in these columns. It is perhaps a little unfortunate that what may be called practical clinical flank of this prophylactic army was allowed to march ahead of—we had almost said get out of touch with—the bacteriological research flank. On the practical side it can be claimed that several hundred thousand infants and children have received this vaccine and that (apart from the Lübeck tragedy) the recorded deaths have been few and, as far as could be ascertained, not attributable directly to the vaccine. How far these infants have been protected from clinical tuberculosis can only be computed by the calculation of probable risks, and the variable factors are so many that this calculation cannot be worked out with any degree of certainty. On the purely bacteriological side the researches of various workers (Petroff, Malkani, Dreyer and Vollum, and others) have suggested that a return to virulence on the part of the B C G strain is not impossible. The answer to these experiments has been that the conditions of cultivation on bile potato laid down by Calmette and Guérin have been so altered that an entirely new set of circumstances has been created, or alternatively, that some workers have not been sufficiently careful in guarding against contamination of their cultures with virulent strains of the tubercle bacillus: whilst in at least one instance experiments made by one school have been repeated seriatim by another with opposite results. We cannot here thread our way through all these controversial points. In our last two issues, however, have appeared the records of a painstaking investigation in the Cambridge Field Laboratories by Dr. A. Stanley Griffith, which does much to clear the air. He has found that although B C G can produce tuberculous lesions in guinea-pigs, monkeys, rabbits, and goats, these lesions have no progressive tendency, and after a time heal or become obsolescent. The culture of B C G with which he has worked has retained its cultural characteristics and has not increased its virulence after continuous cultivation for eight years on media, such as egg, which in some hands have produced virulence. He concludes by supporting the contention of Calmette that B C G may be used as a vaccine without risk of causing progressive lesions.

This is the crux of the matter. Bacteriologists can be left to settle the academic points of the B C G controversy at their leisure; the real points at issue are (1) whether the administration of a vaccine of a living but non-virulent strain protects in a way which a vaccine of dead organisms cannot; (2) whether there are risks inherent in the use of living-culture vaccines which cannot be guarded against with reasonable precautions in a well-organised laboratory; and (3) if there are such risks, whether the dangers of tuberculosis in infancy are so great that the risks of the vaccine going wrong are worth taking. The first question is a bacteriological one which has been partially answered by Dr. Griffith's work in our current issues. The B C G strain wanes and finally dies, but in so doing creates antitoxins in animal tissues. We are not quite sure that the method of administration of the vaccine to goats and other animals is strictly comparable to that usually followed by the clinician. It is conceivable also that there is a wider variation in the constitutional powers of infants under modern conditions of life than occurs amongst even domesticated goats and rabbits. We must not be content to admit that B C G vaccine administered to infants has done no harm—Lübeck apart; we must be convinced that it has definitely conferred a valuable measure of immunity. Turning now to the second question, can the bacteriologist ensure that no untoward accidents shall happen to the living vaccine so that it shall never contain virulent organisms? At Lübeck certain important precautions were not taken, and the verdict of the court reflected the views of those who sat in judgment as to the seriousness of the neglect. Before B C G vaccine is extensively used in this country it is to be hoped that an expert committee of bacteriologists will

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In 1-lb tins—1/9

per cent. of the total. Cases considered arteriosclerotic in origin amounted to 31 per cent., while those in which the heart failure was consequent upon hyperpiesia were 17 per cent. of the whole series. The differentiation of the last two groups is admittedly difficult, and McEachern and Baker take a blood pressure of 150 mm. of mercury as the arbitrary dividing line. If, however, the two categories are added together as "non-rheumatic," they make the largest group in the series—namely, 48 per cent. of the whole. Hyperthyroidism was responsible for some 7 per cent. of the cases, and 5 per cent. were found to be associated with chronic disease of the lungs. In only 3 per cent. was cardiovascular syphilis the causal factor—despite the fact that syphilitic aortitis is recognised in over 15 per cent. of all the patients admitted to the hospital with heart disease. The remaining 2 per cent. fall into a miscellaneous group of uncertain ætiology.

These figures are very similar to those given by W. D. Stroud, L. B. Laplace, and J. A. Reisinger,[2] who have made a parallel study of 253 cases of auricular fibrillation seen in Philadelphia. (Rheumatic, 48 per cent.: "non-rheumatic," 35: syphilitic, 9; thyrotoxic, 3·5: miscellaneous, 4·5.) The low incidence of cardiovascular syphilis as a cause of auricular fibrillation is striking especially in the first series, and it is noteworthy that of 100 cases of luetic heart disease studied by A. Friedlander[3] in Cincinnati, fibrillation occurred in only ten. McEachern and Baker consider that in nine of their 14 cases of syphilitic aortitis auricular fibrillation was produced by administration of digitalis, and in five of these normal rhythm returned on discontinuance of the drug. They report two fresh cases of fibrillation in children under 10, both of whom were suffering from rheumatic carditis, and in a review of published information on this condition in childhood they suggest that in some, at any rate, of the reported cases the fibrillation may have been induced by digitalis therapy. With regard to prognosis both groups of investigators agree about the grave outlook in auricular fibrillation in childhood, the subsequent duration of life being less than a year in both groups. Of the cases reported by Stroud, Laplace, and Reisinger, in which the fibrillation was the result of cardiac rheumatism, in 86 per cent. fibrillation began before the age of 40, and in 88 per cent. the patient was dead before the age of 53. In the arteriosclerotic group, however, the incidence was much later, 72 per cent. of the patients not fibrillating until after the age of 53. The duration of life after the onset of fibrillation they find to be roughly the same in the rheumatic and "non-rheumatic" groups, being two and a half years for those patients now dead, and three and a half for those still living; the maximum duration of life after the onset was 16 years in the first group and 14 years in the second. In most of the thyrotoxic cases normal rhythm returned spontaneously after partial thyroidectomy, but in the syphilitic patients with fibrillation the prognosis is bad, the average duration of life being only two years.

Although Stroud and his co-workers have previously reported favourably on the value of quinidine in the treatment of auricular fibrillation, they are now less enthusiastic about it. The patients successfully treated with this drug were specially selected, and had a minimum of detectable myocardial damage, with little or no sign of congestive failure; yet the average duration of life from the onset of fibrillation was in these cases exactly the same as in those which were considered suitable for treatment with quinidine but failed to react, and only little more than a year longer than in those considered unsuitable for this treatment. Moreover, more than half the cases successfully restored to sinus rhythm by quinidine reverted to fibrillation within 12 months. They further find that patients efficiently treated with digitalis are not less comfortable than those in whom normal rhythm has been restored with quinidine, but the latter are anxious and apprehensive lest the fibrillation should return. They therefore conclude that the most beneficial results in auricular fibrillation are obtained with digitalis, and that quinidine should be reserved for a few selected cases in young people with little or no other evidence of cardiovascular abnormality.

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GIFT OF AN INFECTIOUS DISEASES HOSPITAL.

For many years past the corporation of Wakefield have had under consideration the provision of a new hospital for infectious diseases, and a few months ago proposals were put forward for its erection at a cost of £71,000, including £4500 for the site. On grounds of economy the scheme was abandoned, and it was decided to spend £5000 on repairing and slightly extending the existing institution. A resident of Wakefield, who makes anonymity a strict condition, has now offered to provide £61,500 for the new hospital, being the entire cost less the £5000 the Council intended to spend, and £4500 the value of the site, already owned by the town. The new hospital, which had been completely planned, will have 89 beds and a theatre. There will be two 24-bed pavilions, a cubicle block of eight beds, a tuberculosis block of 16 beds, a diphtheria pavilion of 17 beds, and the necessary administrative accommodation.

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The Milroy lectures of the Royal College of Physicians of London will be delivered on Feb 18th, 23rd, and 25th, by Prof. Cyril Okell, on the Rôle of the Hæmolytic Streptococci in Infective Disease. On March 1st, 3rd, and 8th, Dr. L. J. Witts will give the Goulstonian lectures, on the Pathology and Treatment of Anæmia. Dr. C. E. Lakin's Lumleian lectures will be delivered on March 10th, 15th, and 17th, and their title is the Borderlands of Medicine. Later in the year Miss Harriette Chick, D.Sc., will give the Oliver-Sharpey lectures, on the Relation of Light to Nutrition (May 3rd and 5th), and Dr. J. W. McNee, the Croonian lectures, on the Liver and Spleen and their Clinical and Pathological Associations (June 2nd, 7th, and 9th). All these lectures are to be given at the College at 5 P.M. Members of the medical profession are admitted on presentation of a visiting card.

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[2] Ibid., p. 48.

[3] Amer. Heart Jour., October, 1931, p. 15.

be asked to decide this question. The Therapeutic Substances Act was framed so carefully as to cover such potentially dangerous material as a living virus, but B C G is not sold like an ordinary vaccine to all who come, but is given away, and the Act does not look such a gift horse in the mouth. As to the third question, the mortality from infantile tuberculosis in this country is high enough to warrant risks, but it is steadily falling. Moreover, in the majority of cases, the disease does not swoop down like a wolf on the fold. B C G has been considered by some an analogous case to calf lymph; but tuberculosis is not like small-pox. There are other remedies, and the outlook is not necessarily black or even grey. These factors have to be reckoned with in deciding whether we shall take risks, and if so how much; the ills we know may be more tolerable than the others that we know not of. And lastly, the risks of infection in tuberculosis persist for some years; if not from childhood to the grave, at least from infancy to manhood. We do not know how long B C G protects, nor whether repeated applications of the vaccine will produce the desired results. Festina lente is not necessarily the counsel of despair; it may be the wisdom of sanity.

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VARICELLA AND ZOSTER.

THERE can be little doubt that, were it not for the lack of a suitable experimental animal, the question of the relationship of the viruses of varicella and zoster would have received a definite answer by now. Ever since J. VON BOKAY first put forward the conception of a common ætiology for one type of zoster (zoster varicellosus) and varicella, clinical evidence that zoster gives rise to chicken-pox in susceptible contacts has been steadily accumulating. Some of this evidence, such as that produced by P. J. BRASLAWSKY[1] and P. F. ARMAND DELILLE and Madame TROCMÉ,[2] for instance, has almost the value of a controlled laboratory experiment. And the chain of circumstantial evidence supporting this conception has been considerably strengthened by the serological studies of NETTER and his colleagues; in fact, on the strength of cross complement-fixation reactions, NETTER considers that all cases of zoster, idiopathic and symptomatic, are caused by the virus of varicella. In a recent paper by E. BRUUSGAARD,[3] which starts with a critical and unbiased review of the situation, some experiments on children are described. KUNDRATITZ,[4] he says, reported that young children who had had neither zoster nor varicella, could be infected by dermal inoculation with zoster vesicle fluid, the result being a local vesicular lesion followed, in some instances, by a generalised vesicular eruption indistinguishable from chicken-pox. Children who had had chicken-pox were refractory to the zoster inoculation, and those who had recovered from experimental zoster were not susceptible to the local implantation of chicken-pox vesicle fluid. BRUUSGAARD'S findings are in keeping with those of KUNDRATITZ. Eighteen children were inoculated in the skin with zoster vesicle fluid and eight showed "takes." In four of these there was a local response only, but in the other four there was a generalised eruption indistinguishable from chicken-pox. Further, he was able to transmit the condition by inoculation from one case, and in several instances clinical varicella developed in susceptible children placed in contact with the experimentally infected ones.

Findings such as those of KUNDRATITZ and BRUUSGAARD are very strong evidence that the causal viruses of these two diseases are identical; in fact, it is difficult to see what other interpretation to put on them. Against this conception has been advanced certain epidemiological evidence. Chicken-pox is a disease of childhood, whereas zoster occurs principally in adults. Both diseases apparently confer a lasting immunity, yet it is common for zoster to occur in a person who had varicella in childhood. At first sight these facts are at variance with the idea of a common ætiology for these two diseases, but is this really so? The available evidence suggests that in virus diseases which confer a lasting immunity there is a persistence of the virus in the body; a state of armed neutrality, so to speak. And if this is so, where more likely for the chicken-pox virus to persist than in the central nervous system, where it would be less exposed to the action of viricidal antibody? Later on in adult life, when the immunity acquired from the attack of chicken-pox might be waning, any factor exciting a deleterious action on the central nervous system (trauma, tumours, and poisons such as arsenic and bismuth in symptomatic zoster; unknown in idiopathic zoster) would light the dormant virus into activity giving us the disease zoster. The virus would track to the skin via the spinal nerves, and any subsequent tendency to generalisation would be held in check by the residual chicken-pox immunity. Admittedly this is pure hypothesis, and is not in keeping with the statement that zoster occurs in isolated communities where chicken-pox is unknown—an observation which may not necessarily be correct. But it does help to bring into line conflicting clinical, epidemiological, and experimental evidence, and might conceivably be of service as a working hypothesis in future investigation.

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AURICULAR FIBRILLATION.

IN an attempt to throw further light on the cause of this form of cardiac failure, D. MCEACHERN and B. M. BAKER[1] have studied a series of 575 patients with auricular fibrillation seen at the Johns Hopkins Hospital in the past 12 years. Electrocardiographic evidence of the arrhythmia was obtained in all cases. The largest ætiological group was composed of those suffering from rheumatic heart disease, who formed about 34

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[1] Presse Méd., Nov. 14th, 1931, p. 1671; see THE LANCET, 1931, ii, 1199.

[2] Bull. et mém. Soc. méd. hôp. de Paris, Jan. 25th, p. 48.

[3] Brit. Jour. Derm. and Syph., 1932, xliv., 1.

[4] Monat. f. Kinderheilk., 1925, xxix., 516.

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[1] Amer. Jour. Med. Sci., January, 1932, p 35.

account rather of the difficulties than of the achievements of the method and from the brief description given it is not easy to appreciate what is likely to be its value. The fuller account which is promised for an early date will therefore be awaited with interest. Meanwhile, the article serves to emphasise rather than to minimise the difficulties of the problem, and one is left still with the impression that, while capacity may be comparatively well assessed by tests, the elusiveness of personality is such that it can only be tested by life.

HYPNOSIS AND ANÆSTHESIA.

It is doubtful whether hypnosis will ever be relied on to play a large part in practical administration of anæsthesia. Indeed Dr. Bernard Hollander disclaimed any pretension of the sort when he read his paper before the anæsthetic section of the Royal Society of Medicine on Feb. 5th. Nevertheless he was able to show from numerous instances in his own experience and that of others that perfect surgical anæsthesia can be obtained purely through hypnosis. He expressed the opinion that in certain circumstances hypnosis should be employed either alone or as an aid to induction, and it appears that it might very well serve sometimes to replace preliminary drugs in procuring calm and banishing apprehension from some types of subject. The paper gave a comprehensive account of the history of hypnosis, but did not venture far into the disputed territory of its physiological and psychological explanations. Nor did subsequent speakers, who included, among others, Lady Berry, Dr. H. Yellowlees, and Dr. J. A. Hadfield, deal much with this side of the subject. A good many personal experiences were related, and one speaker advanced the opinion that, therapeutically, plain speaking on psycho-analytical lines could often effect better than hypnosis and suggestion what the physician was seeking to procure in his patient. Insomnia is certainly a condition for whose relief hypnosis has sometimes succeeded where all else has failed, and the same may be said with reservation of inebriety. For the relief of pain hypnotism can be of great service, and it was interesting to hear Dr. Hollander relate his early experiences in treating patients of the late Sir David Ferrier at King's College Hospital as long ago as the early 'nineties.

BACTERIOPHAGE IN INFANTILE DYSENTERY.

The claims of d'Herelle for the therapeutic value of bacteriophage in bacillary dysentery have received very little support and have been the subject of numerous adverse communications. It has always been a possible objection to negative results that the bacteriophage administered may not have been of maximum potency, but with increasing experience of the properties of this agent the criticism has become of little force. A paper now presented by F. M. Burnet, Margot McKie, and I. J. Wood[1] details the results of this form of treatment in the bacillary dysentery of infants in Australia. This infection is almost wholly of the Flexner type and has been treated by these workers with highly active, polyvalent, anti-Flexner strains of bacteriophage, including d'Herelle's own *Bact-dysenterie-phage*. The results were disappointing, for in 25 treated cases the mortality was 44 per cent., whilst in 33 untreated controls it was 27 per cent. There are certain other facts of interest in these observations. It was noticed that the spontaneous appearance of bacteriophage was relatively rare among the younger infants observed: thus of 19 cases, below the age of 9 months, there were only seven in which the agent was present, whereas of 63 cases over this age, 43 developed a bacteriophage at some period in the course of their illness. This inequality in distribution may perhaps be correlated with the fact that in a detailed analysis of the treated cases the only ones which showed any suggestion of benefit from the specific treatment were the youngest infants. Here, however, the figures given are too small for any conclusions to be drawn. The authors accordingly reach the general conclusion that the Flexner bacteriophage has no influence on the course of infantile dysentery.

MENSTRUATION AND ATHLETICS.

The effect of physical exercise on menstruation has been studied[1] at Kiel, where an athletic sports' meeting in 1930 provided an opportunity for an inquiry amongst the women competitors. A questionaire was prepared beforehand and during the 20 minutes' pauses between the different team events the athletes were introduced in groups and were examined according to the questionaire. In this way 243 competitors were interviewed. The entrants, who were drawn from a large variety of trades and professions, varied in age from 15–39, were divided into two groups: (*a*) those who had joined the athletic club before the onset of puberty; (*b*) those who had joined after puberty. In these two groups there was found to be no marked difference in the age of onset of puberty which was 14·6 years in group (*a*) and 14 years in group (*b*). In answer to inquiry about capacity for work during menstruation the following facts were elicited. Among 243 competitors 7·4 per cent. were better at work or games, 49 per cent. noticed no difference, 35 per cent. found they were less good, and 8 per cent. could not say, for they had never attended physical exercise during a period.

A table was compiled of the irregularities of menstruation remarked in the course of the questionaire and 44 competitors made additional statements. To give the figures and relate the statements in detail is here unnecessary, but they give an important indication of a direct effect of physical exercise on the course of menstruation; further, those cases where a beneficial effect was noted are of definite value as demonstrating clearly that in some cases good does result. The next question to be investigated was "Are disturbances of menstruation found more often or more seldom in athletes than in other women of similar age or profession?" As a control, the statements of girls attending the evening classes in their last year at the Women's Technical School at Kiel were taken; these girls formed a particularly favourable group as scholarships are hard to obtain, and only the healthiest candidates are selected. It was found that disturbances in rhythm of the menstrual period showed similar figures in both classes, but the course of the period showed greater disturbances among members of athletic clubs than among the students. The fact that the loss may be prolonged and increased by physical exercise and that pain may be enhanced if an athletic competition occurs during a period, stood out clearly, though it seemed fair to presume that psychical influences played a part also. From this investigation it appears that there is no necessity to stop all gymnastic

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[1] Med. Jour. of Australia, 1931, ii., 714.

[1] Brunn, L.: Münch. Med. Woch., 1931, lxxviii., 1913.

ANNOTATIONS

SCIENCE AND THE MEAT INDUSTRY.

THE indebtedness of the meat industry to science is set out by Dr. T. Moran in the issue of *Chemistry and Industry* for Jan. 29th in an essay which makes useful reading. The transport of meat from the other side of the world to this country, which is the subject of Dr. Moran's reflections, is a triumph of the application of scientific research. Frozen mutton at a temperature in the region of –10° C. is brought to us on a 40-day journey from Australia; the shorter journey from South America, 18 to 25 days, permits of the transport of beef in the chilled state—i.e., at a temperature equal to or slightly below the freezing point of the tissue, roughly –1° C. Owing to its close resemblance to home-killed meat chilled meat as an article of commerce commands a higher price than the same meat when frozen, so that the experiments now being made with the object of bringing mutton in the chilled state from Australia have an economic reason. But on arrival in this country chilled meat, being much more perishable than frozen meat, must be sent to the markets for immediate sale; the vast bulk of frozen meat, on the other hand, is perfectly wholesome after storage for a year or more at –10° C., the growth of micro-organisms ceasing at about –7° C. A certain amount of spoilage occurs owing to oxidation of the fat; lower fatty acids are formed, and, what is more important, aldehydes which impart an unpleasant taste to the fat; bacon suffers especially, and cannot be kept satisfactorily for long periods in cold storage. Investigations made by the Food Investigation Board seem to point to the harmful influence of light. The comparatively short distances between the ports and points of retail in this country make it sufficient for imported chilled and frozen meat to be despatched by road or rail from the docks or markets in insulated vans or containers. For the railway journey from Aberdeen to London, which may afford as an example of the longest journey in Great Britain taken with a commercial objective, a railway van was equipped, as an experiment, with a self-contained refrigerating plant. Methyl chloride was used as the refrigerant; the pump was driven off the axle and the vessel containing the refrigerant was immersed in brine drums containing potassium chromate brine, which has a freezing point of –11·3° C. During stoppages the drums provided a reserve of cold.

Present-day knowledge does not permit of any distinction being made between the actual nutritive value of home-killed, chilled and frozen meat, but there is the all-important question of flavour. The palatability of the flesh is largely dependent upon the breed of the animal. From South America the best quality meat exported is chilled and the lower quality frozen. It is quite possible for imported chilled meat to be superior in flavour to home-killed meat, but to the refined taste the flavour of the best Scotch beef surpasses that of the best chilled beef. Any application of science which makes the appearance of frozen meat approach more closely to that of home-killed meat is appreciated by the meat industry. Frozen meat drips on thawing and the hæmoglobin from the blood is suffused into the neighbouring fat, giving it a pink tinge. It has been found, however, that if the rate of freezing is sufficiently rapid the drip is negligible. This rapid rate can only be realised with small thicknesses of tissue—e.g., steaks and small joints—and then by some special technique, such as freezing in cold brine.

Much is expected from the result of recent investigations on the conditioning or ripening of beef. Meat of inferior quality when kept in cold storage, especially in the form of sides or quarters, increases in palatability and tenderness. This is due to a change in the chemical basis of the connective tissue, collagen, which is readily converted into gelatin. The collagen is present in the form of fine films which ramify in all directions to form a continuous tough membrane; gelatin on the contrary is very tender. When meat is kept in cold storage there is a slow softening and swelling of the collagen.

ASSESSMENT OF TEMPERAMENT.

AN article by Mr. P. E. Vernon in the January number of the *Eugenics Review* is at once a reminder of the weak spot in existing resources for mental testing and a contribution to its strengthening. While general intelligence and specialised aptitudes can now be assessed in such a way as to make estimation of educational and vocational potentialities reasonably accurate "the affective factors of temperament and personality and of interest still seem to be beyond us," and it is these factors which determine whether the potentialities are likely to be realised in actual fact. Mr. Vernon attributes this lack of success in measuring personality to the indefiniteness of temperamental tracts, as compared with qualities of physique and intelligence. One trait may be exhibited by a person in one set of circumstances, and a totally opposite trait by the same person in other circumstances. Different traits may also be elicited in the presence of different observers—teachers, school friends, and relatives may differ greatly in their estimates of a child with regard to a particular trait, or may even describe in differing terms their impressions of a child based upon one and the same episode. All these facts show the unreliability of the rating methods of testing which depend on the judgments of individual observers. Mr. Vernon's own method does not completely evade these difficulties. Stated briefly, it is a method of "sampling" with three parts. To obtain a measure of a person's timidity, for example, a number of test situations are devised to which some would respond with timid, and others with courageous, behaviour, and the reaction of the subject is recorded. The second part is a questionaire about his past behaviour under conditions likely to elicit fear or the opposite. Three or four possible answers being suggested to each question, the subject being asked to supply the answer which best describes himself. The third part is an estimate on a scale by other people, based on actual objective behaviours of his timidity. The samplings have then to be judged and scored in relation to their distribution in a large group of individuals of nearly similar background and age, and when a group of samplings for different traits have been so made and scored for an individual, it is necessary to discover the extent to which the different results correlate. The method is obviously elaborate and liable to fallacy. The reliability, for example, of the subject's replies to the questionaire will depend upon his sincerity in stating his real reaction to the situations presented. The possibilities of bias cannot be excluded from the reports of other observers. Mr. Vernon, indeed, confesses that his paper is an from Brock and Blair's studies is not to allow the recovering heart to pump too forcibly or too much. Early venesection seems definitely demanded to reduce the pressure in the lung, because, as Matzuoka pointed out, œdema could be produced whether the increased pressure was due to a forward or a back pressure, and venesection will lessen both. It seems probable that the condition giving rise to this serious symptom might more often be treated successfully if venesection was carried out promptly.

ARTHUR CHUDLEIGH.

Mr. Arthur Chudleigh, the well-known theatrical manager, who died on Friday, Feb. 5th, had more than one connexion with the medical profession, many members of which, in company with a large public, will regret his death. He was the son of a doctor and, under his real name of Lillies, was educated at Epsom College, the intention being that he should follow his father's career. But an early attraction to the stage dictated for him a very different life. Although as an actor he made no particular mark, he made what was more important, very many friends, through his engaging personal qualities, with the result that he was able when quite a young man and with no private means to take over the management of the Court Theatre. This he did in partnership with Mrs. John Wood, a really popular favourite, and to make an immediate practical success of the venture was the more creditable in that his predecessors in the management, Arthur Cecil and John Clayton, had taught the public to expect much. The high standard of amusement was maintained, and for years the Court Theatre resounded with the laughter due to the wit of the Pinero farces, and their representation by a company of brilliant actors and actresses. This managerial success Chudleigh repeated at the Comedy Theatre, remaining associated with stage production until some 15 years ago. About this time he joined the Council of Epsom College and became an assiduous and generous supporter of the recent developments taking place in the foundation. At the largely attended memorial service, held at St. Martin-in-the-Fields on Tuesday last, the Council of the College and the educational staff were represented.

THE MEDICAL INDUCTION OF LABOUR.

A PAPER by Mr. R. L. Dodds analysing 338 cases of medical induction of labour at the City of London Hospital[1] bears out many conclusions to which we referred in a recent annotation.[2] The cases were studied with a view to evaluation of the factors leading to successful induction and of the risks of repeated attempts as regards the effect both on the course of the subsequent labour and on the fœtus. The method of induction adopted was the administration of 1½ oz. of castor oil followed two hours later by an enema and a hot bath; quinine sulphate, grs. 20, was then given in two-hourly doses of grs. 10, 5, and 5, and, if labour had not begun in 11 hours, two injections of 0·5 c.cm. of pituitrin were given at intervals of an hour. The criterion of success was the onset of labour within 24 hours of the first dose of quinine. Success was obtained in 183 cases (54 per cent.). The usual experience that the degree of maturity is the most potent factor in success was confirmed, the percentages of successful cases being 40, 51, and 65 respectively in 101 cases induced prematurely, 88 induced at term, and 149 induced when the pregnancy had exceeded its usual duration. Albuminuric cases also showed a higher percentage of successes (62) compared with the non-albuminuric (52·7). The chances of success when a second or third course of treatment was tried were less than after the first course, and this lack of sensitiveness of the uterus appeared to show itself also in inertia in the first stage, which was of longer duration, and by a high proportion of instrumental deliveries in the second stage. Too many factors, however, come into consideration—in a group of cases containing a large percentage of inductions performed for disproportion—to allow of definite conclusions. The forceps rate is not as high as in the American figures quoted in our last annotation in which we questioned the advantage of repeated attempts at medical induction because of the very small number of cases in which natural delivery followed. The figures in Mr. Dodds's paper show another experience also noted by the American observer in that no greater success was obtained by the use of grs. 50 of quinine than with grs. 20. The stillbirth-rate was high (10·7 per cent.), and in five cases among 344 births quinine fell under suspicion; but here again so many other complicating factors were present that Mr. Dodds draws the conclusion that less than 2 per cent. of medically induced labours result in stillbirths "possibly due to quinine."

THE IRIS IN VERTEBRATES.

THE latest fruit of Miss Ida Mann's research into the comparative anatomy of the eye is an elaborate account of the iris in vertebrates.[1] It is enriched by 57 coloured illustrations, most of them pictures of the irides of animals in the Zoological Gardens, London, and in themselves very beautiful. These pictures had to be made from the living eye, and while reptiles and amphibians proved fairly amenable, the mammals were usually troublesome and the fish very difficult. The characters to which special attention was directed were arrangement of blood-vessels, shape of pupil, nature and distribution of pigment, and relation of pigment pattern to skin pattern where such existed. In mammals the main plan of the circulation never varies; there is a circumferential arterial circle giving radial branches superficially to the inner circle where they anastomose with veins. The human iris is typical. The shape of the pupil, however, is very variable in mammals, deviations from the circular shape being correlated with the mode of life of the animal. In nocturnal animals, including most carnivores, it is vertically oval. In diurnal, shade-loving animals such as herbivores it is oval horizontally. As to pigmentation, in mammals this is typically some shade of brown. All the varieties of colour in the human iris are due to varying amounts and distribution of this pigment, most of it deposited as a rule during the first six months after birth. In birds, the vascular arrangement, which is to be considered the most fundamental character, is different from that seen in mammals. There being no pupillary membrane the superficial layer of the iris is absent, and the vessels correspond to those in the deeper layer of the mammalian iris, which are not normally visible during life. The sphincter of the pupil is well developed and is composed of striped muscle, not contracting reflexly to light exercises during a menstrual period, for sometimes disturbances of menstruation were found to disappear when physical exercises were continued during the period. On the other hand, there appeared to be a certain number of women whose constitution required that they should spare themselves during menstruation and these should not be induced to continue physical exercise at that time.

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[1] Jour. Obstet. and Gyn. Brit. Emp., 1931, xxxviii., 827.

[2] THE LANCET, 1931, ii., 1311.

[1] Iris Pattern in the Vertebrates. By Ida Mann, D.Sc., M.B., F.R.C.S. Reprinted from Trans. Zool. Soc. Lond. 1931. Part 4.

HEAT-STROKE.

HEAT-STROKE has received more notice lately, and a recent number of the *Tropical Diseases Bulletin*[1] summarises eight papers which have appeared during the past year. P. Cazamian,[2] it is stated, gives a careful study of heat-stroke as it is seen in steamships and takes the view that coagulation of myosin occurs in the affected muscles. He recommends injections of ether, caffeine, camphor, and glucose, and plenty of fluid to drink. Twenty mild cases among the troops in Allahabad have been described by C. F. P. Hamilton, D. N. Busu, and J. Van Haeften,[3] and F. Marsh has discussed the ætiology[4] and described experiments with rabbits, from which he concludes that the heat rays and not the ultraviolet rays are responsible for heat-stroke. Since these contributions were analysed in the bulletin Surgeon-Lieut. Hugh Willoughby and Flight-Lieut. Edward Aslett[5] have produced a review of the subject which repays attention.

The term "heat-stroke" they point out, does not represent a simple clinical entity but includes three morbid states—heat exhaustion, heat hyperpyrexia, and sun traumatism. Heat exhaustion is a syncope with symptoms of shock, directly due to interference with heat loss. The attack is generally sudden and short, characterised by giddiness, collapse, dilated pupils, cold skin, soft, small fluttering pulse, and subnormal temperature. The patient usually recovers when placed in a cool temperature and given stimulants. As his temperature is already subnormal he should not be douched, but his face may be sprayed with cold water, and in severe cases camphor in oil may be injected and hot-water bottles applied. These writers recommend brandy as an excellent standby. A man ought to be ready for duty again in 24 to 48 hours. Heat hyperpyrexia is due to exposure to high temperature, but occurs in certain districts only: in the valleys and deltas of rivers and on low-lying coasts, but never on the high seas. It is due to inability to lose heat by the normal routes. It may be predominantly nervous, gastric, or choleraic in its symptomatology. The temperature may be as high as 110° F., the face is flushed, the skin hot and dry, the breathing stertorous, and consciousness entirely lost. The pupils are contracted, and the urine, which is usually offensive, contains indican. Prompt and energetic treatment is essential; the temperature must be reduced to 104° F. by sprays, douches, and iced enemata, and then the patient should be wrapped in a dry blanket and left alone lest hypopyrexia follow. In a dry climate the temperature is best reduced by a fine spray, covering the body with small globules to dissipate heat by evaporation; in humid climates heavy douching with iced water and rubbing the body with ice, to dissipate heat by conduction, is better. Alcohol is contra-indicated until sweating is re-established, and strychnine must never be given. Artificial respiration may be necessary, and strophanthin and intravenous alkali are useful. An attack can be prevented by proper attention to premonitory symptoms: restlessness, vertigo, headache, confusion, anorexia, thirst, sighing, nausea, vomiting, and suppression of sweat. In Willoughby and Aslett's opinion, nobody who has had an attack of heat hyperpyrexia should continue to live in the tropics.

The third form of heat-stroke—sun traumatism—they ascribe to some unexplained action of the heat rays of the sun, but an attack often occurs on an overcast day. The symptoms are intense headache and intolerance to light and sound, rapid full pulse, vomiting, dry skin, and perhaps delirium. The treatment consists in absolute rest and quiet in a dark room, with ice packs for the head and bromides if necessary. The after-effects may be serious—loss of memory, mental confusion, and inability to concentrate—and here again the patient should cease to live in the tropics.

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ACUTE PULMONARY ŒDEMA.

ACUTE pulmonary œdema is one of the most dramatic symptoms in medicine, and several theories have been advanced to explain its origin. Cases in which it develops after the exhibition of various drugs such as organic arsenical preparations or quinine, after exposure to irritating gases, or as a manifestation of some chemical poison, form but a small though clear group compared with those in which it occurs in the course of heart disease, especially mitral stenosis or hypertensive heart failure, whether due to renal disease or hyperpiesia. A paper by R. C. Brock and E. A. Blair[7] dealing with experiments on respiratory movements, describes in detail the series of events in the production of the œdema and in a few particulars amplifies the work done on that subject by Y. Matzuoka in 1915. In the heart-lung preparation they found that occasionally for some obscure reason, when the artificial circulation was opened up, the heart failed to maintain an efficient circulation. As the cardiac condition improved, this failure was almost always followed by a rapidly progressive pulmonary œdema. This is what the clinician would expect from observations on human beings, and it gives clear indications and contra-indications for treatment. As M. C. Winternitz and R. A. Lambert pointed out in 1919, it is not the œdema that kills but the underlying serious state, and it is not surprising that atropine is useless. Brock and Blair also observed in their experiments that respiratory movements increased the œdema and consequently the use of artificial respiration as advised by H. Emerson in 1909 and based on animal experiments seems unjustifiable. But the definite indication gained from Brock and Blair's studies is not to allow the recovering heart to pump too forcibly or too much. Early venesection seems definitely demanded to reduce the pressure in the lung, because, as Matzuoka pointed out, œdema could be produced whether the increased pressure was due to a forward or a back pressure, and venesection will lessen both. It seems probable that the condition giving rise to this serious symptom might more often be treated successfully if venesection was carried out promptly.

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[1] Trop. Dis. Bull., Nov. 1931.

[2] Arch. Méd. et Pharm. Nav., 1928, cxviii., 102.

[3] Jour. Roy. Army Med. Corps., 1930, lv., 120.

[4] Trans. Roy. Soc. Med. Hyg., 1930, xxiv., 257.

[5] Jour. Roy. Naval Med. Serv., Jan., 1932, p. 1.

[6] Trans. Roy. Soc. Med. Hyg., 1930, xxiii., 645.

[7] Jour. Thoracic Surg., 1931, i., 57.

ARTHUR CHUDLEIGH.

Mr. Arthur Chudleigh, the well-known theatrical manager, who died on Friday, Feb. 5th, had more than one connexion with the medical profession, many members of which, in company with a large public, will regret his death. He was the son of a doctor and, under his real name of Lillies, was educated at Epsom College, the intention being that he should follow his father's career. But an early attraction to the stage dictated for him a very different life. Although as an actor he made no particular mark, he made what was more important, very many friends, through his engaging personal qualities, with the result that he was able when quite a young man and with no private means to take over the management of the Court Theatre. This he did in partnership with Mrs. John Wood, a really popular favourite, and to make an immediate practical success of the venture was the more creditable in that his predecessors in the management, Arthur Cecil and John Clayton, had taught the public to expect much. The high standard of amusement was maintained, and for years the Court Theatre resounded with the laughter due to the wit of the Pinero farces, and their representation by a company of brilliant actors and actresses. This managerial success Chudleigh repeated at the Comedy Theatre, remaining associated with stage production until some 15 years ago. About this time he joined the Council of Epsom College and became an assiduous and generous supporter of the recent developments taking place in the foundation. At the largely attended memorial service, held at St. Martin-in-the-Fields on Tuesday last, the Council of the College and the educational staff were represented.

THE MEDICAL INDUCTION OF LABOUR.

A PAPER by Mr. R. L. Dodds analysing 338 cases of medical induction of labour at the City of London Hospital[1] bears out many conclusions to which we referred in a recent annotation.[2] The cases were studied with a view to evaluation of the factors leading to successful induction and of the risks of repeated attempts as regards the effect both on the course of the subsequent labour and on the fœtus. The method of induction adopted was the administration of 1½ oz. of castor oil followed two hours later by an enema and a hot bath; quinine sulphate, grs. 20, was then given in two-hourly doses of grs. 10, 5, and 5, and, if labour had not begun in 11 hours, two injections of 0·5 c.cm. of pituitrin were given at intervals of an hour. The criterion of success was the onset of labour within 24 hours of the first dose of quinine. Success was obtained in 183 cases (54 per cent.). The usual experience that the degree of maturity is the most potent factor in success was confirmed, the percentages of successful cases being 40, 51, and 65 respectively in 101 cases induced prematurely, 88 induced at term, and 149 induced when the pregnancy had exceeded its usual duration. Albuminuric cases also showed a higher percentage of successes (62) compared with the non-albuminuric (52·7). The chances of success when a second or third course of treatment was tried were less than after the first course, and this lack of sensitiveness of the uterus appeared to show itself also in inertia in the first stage, which was of longer duration, and by a high proportion of instrumental deliveries in the second stage. Too many factors, however, come into consideration—in a group of cases containing a large percentage of inductions performed for disproportion—to allow of definite conclusions. The forceps rate is not as high as in the American figures quoted in our last annotation in which we questioned the advantage of repeated attempts at medical induction because of the very small number of cases in which natural delivery followed. The figures in Mr. Dodds's paper show another experience also noted by the American observer in that no greater success was obtained by the use of grs. 50 of quinine than with grs. 20. The stillbirth-rate was high (10·7 per cent.), and in five cases among 344 births quinine fell under suspicion; but here again so many other complicating factors were present that Mr. Dodds draws the conclusion that less than 2 per cent. of medically induced labours result in stillbirths "possibly due to quinine."

THE IRIS IN VERTEBRATES.

THE latest fruit of Miss Ida Mann's research into the comparative anatomy of the eye is an elaborate account of the iris in vertebrates.[1] It is enriched by 57 coloured illustrations, most of them pictures of the irides of animals in the Zoological Gardens, London, and in themselves very beautiful. These pictures had to be made from the living eye, and while reptiles and amphibians proved fairly amenable, the mammals were usually troublesome and the fish very difficult. The characters to which special attention was directed were arrangement of bloodvessels, shape of pupil, nature and distribution of pigment, and relation of pigment pattern to skin pattern where such existed. In mammals the main plan of the circulation never varies; there is a circumferential arterial circle giving radial branches superficially to the inner circle where they anastomose with veins. The human iris is typical. The shape of the pupil, however, is very variable in mammals, deviations from the circular shape being correlated with the mode of life of the animal. In nocturnal animals, including most carnivores, it is vertically oval. In diurnal, shade-loving animals such as herbivores it is oval horizontally. As to pigmentation, in mammals this is typically some shade of brown. All the varieties of colour in the human iris are due to varying amounts and distribution of this pigment, most of it deposited as a rule during the first six months after birth. In birds, the vascular arrangement, which is to be considered the most fundamental character, is different from that seen in mammals. There being no pupillary membrane the superficial layer of the iris is absent, and the vessels correspond to those in the deeper layer of the mammalian iris, which are not normally visible during life. The sphincter of the pupil is well developed and is composed of striped muscle, not contracting reflexly to light exercises during a menstrual period, for sometimes disturbances of menstruation were found to disappear when physical exercises were continued during the period. On the other hand, there appeared to be a certain number of women whose constitution required that they should spare themselves during menstruation and these should not be induced to continue physical exercise at that time.

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[1] Jour. Obstet. and Gyn. Brit. Emp., 1931, xxxviii., 827.

[2] THE LANCET, 1931, ii., 1311.

[1] Iris Pattern in the Vertebrates. By Ida Mann, D.Sc., M.B., F.R.C.S. Reprinted from Trans. Zool. Soc. Lond. 1931. Part 4.

HEAT-STROKE.

HEAT-STROKE has received more notice lately, and a recent number of the *Tropical Diseases Bulletin*[1] summarises eight papers which have appeared during the past year. P. Cazamian,[2] it is stated, gives a careful study of heat-stroke as it is seen in steamships and takes the view that coagulation of myosin occurs in the affected muscles. He recommends injections of ether, caffeine, camphor, and glucose, and plenty of fluid to drink. Twenty mild cases among the troops in Allahabad have been described by C. F. P. Hamilton, D. N. Busu, and J. Van Haeften,[3] and F. Marsh has discussed the ætiology[4] and described experiments with rabbits, from which he concludes that the heat rays and not the ultraviolet rays are responsible for heat-stroke. Since these contributions were analysed in the bulletin Surgeon-Lieut. Hugh Willoughby and Flight-Lieut. Edward Aslett[5] have produced a review of the subject which repays attention.

The term "heat-stroke" they point out, does not represent a simple clinical entity but includes three morbid states—heat exhaustion, heat hyperpyrexia, and sun traumatism. Heat exhaustion is a syncope with symptoms of shock, directly due to interference with heat loss. The attack is generally sudden and short, characterised by giddiness, collapse, dilated pupils, cold skin, soft, small fluttering pulse, and subnormal temperature. The patient usually recovers when placed in a cool temperature and given stimulants. As his temperature is already subnormal he *should not be douched, but his face may be sprayed* with cold water, and in severe cases camphor in oil may be injected and hot-water bottles applied. These writers recommend brandy as an excellent standby. A man ought to be ready for duty again in 24 to 48 hours. Heat hyperpyrexia is due to exposure to high temperature, but occurs in certain districts only: in the valleys and deltas of rivers and on low-lying coasts, but never on the high seas. It is due to inability to lose heat by the normal routes. It may be predominantly nervous, gastric, or choleraic in its symptomatology. The temperature may be as high as 110° F., the face is flushed, the skin hot and dry, the breathing stertorous, and consciousness entirely lost. The pupils are contracted, and the urine, which is usually offensive, contains indican. Prompt and energetic treatment is essential; the temperature must be reduced to 104° F. by sprays, douches, and iced enemata, and then the patient should be wrapped in a dry blanket and left alone lest hypopyrexia follow. In a dry climate the temperature is best reduced by a fine spray, covering the body with small globules to dissipate heat by evaporation; in humid climates heavy douching with iced water and rubbing the body with ice, to dissipate heat by conduction, is better. Alcohol is contra-indicated until sweating is re-established, and strychnine must never be given. Artificial respiration may be necessary, and strophanthin and intravenous alkali are useful. An attack can be prevented by proper attention to premonitory symptoms: restlessness, vertigo, headache, confusion, anorexia, thirst, sighing, nausea, vomiting, and suppression of sweat. In Willoughby and Aslett's opinion, nobody who has had an attack of heat hyperpyrexia should continue to live in the tropics.

The third form of heat-stroke—sun traumatism—they ascribe to some unexplained action of the heat rays of the sun, but an attack often occurs on an overcast day. The symptoms are intense headache and intolerance to light and sound, rapid full pulse, vomiting, dry skin, and perhaps delirium. The treatment consists in absolute rest and quiet in a dark room, with ice packs for the head and bromides if necessary. The after-effects may be serious—loss of memory, mental confusion, and inability to concentrate—and here again the patient should cease to live in the tropics.

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[2] Arch. Méd. et Pharm. Nav., 1928, cxviii., 102.
[3] Jour. Roy. Army Med. Corps., 1930, lv., 120.
[4] Trans. Roy. Soc. Med. Hyg., 1930, xxiv., 257.
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[7] Jour. Thoracic Surg., 1931, i., 57.

SPECIAL ARTICLES

A STUDY OF THE B C G STRAIN OF TUBERCLE BACILLUS.

WITH AN ACCOUNT OF TWO IMMUNITY EXPERIMENTS AND A PRELIMINARY REPORT ON THE CULTIVATION OF TUBERCLE BACILLI ON BILE MEDIA.

By A. Stanley Griffith, M.D. Vict.,
Ph.D. Camb.,
MEMBER OF THE SCIENTIFIC STAFF, MEDICAL RESEARCH COUNCIL.

(From the Field Laboratories, University of Cambridge.)

(Concluded from p. 305.)

The Two Immunity Experiments.

The immunity experiments reported in The Lancet by Buxton and Griffith[6] showed that a high degree of resistance against experimental tuberculosis can be conferred upon calves by vaccination with B C G. In that paper mention was made of two preliminary immunity experiments on calves, the details of which were not then given. Advantage is taken of this report to put them on record.

The experiments were undertaken by me in 1926 for the purpose of comparing the immunising value of B C G with that of an attenuated though still nosogenic strain of human tubercle bacilli obtained from lupus.

The calves which were kindly presented to me by Prof. J. B. Buxton were 3 to 4 months old and had not reacted to the double intradermal tuberculin test.

The following table gives the details of the vaccinations.

Date in 1926.	Method of vaccination.	Calf B. B C G.	Calf C. H 131 (lupus).
Jan. 28th ..	Subcut.	100 mg.	100 mg.
March 17th ..	Intrav.	5 ,,	5 ,,
May 5th ..	,,	10 ,,	10 ,,
June 21st ..	,,	50 ,,	50 ,,

Both calves reacted on May 5th to the intravenous injection of the third dose of vaccine, the temperature rising to 104·5° F. and 105·2° F. respectively.

Resistance test.—On August 26th, 1926, 66 days after the last dose of vaccine each calf was inoculated intravenously with 1·0 mg. of virulent bovine tubercle bacilli. At the same time two adult goats, one 18 months and one some years old, were inoculated intravenously with ·01 mg. of the same bovine culture to serve as controls, no calves being available. The goats died in 35 and 38 days of severe miliary tuberculosis of the lungs, the thoracic glands also showing extensive tuberculosis. Both calves reacted vigorously to the test inoculation and were ill for about a week; the temperatures rose to 106·8° F. and 107·3° F. respectively at the 21st hour and remained at a high level for three days, after which they fell to normal. The calves regained their health and grew into fine beasts.

The bullock (calf C) was used towards the end of 1927 for the purpose of producing a therapeutic serum and was given a series of injections of B C G. On Sept. 16th, 1927, he was injected subcutaneously with 200 mg. of B C G; there was no temperature reaction. On Oct. 3rd, 1927 he was given an intravenous inoculation of 10 mg. B C G; the temperature rose 3·1° F. at the 15th hour, and was high for three days. On Nov. 17th, 1927, an intravenous inoculation of 10 mg. of B C G again gave a good reaction. On Dec. 7th, 1927, a dose of 100 mg. of B C G was inoculated intravenously; the temperature rose on this occasion from 101·4° F. just before the injection to 105·8° F. at the 16th hour and 105·9° F. at the 19th hour, and was maintained at a high level during three days. On May 20th, 1928, five and a half months after the last dose of B C G, the double intradermal tuberculin test gave a negative reaction.

The bullock was killed on May 23rd, 1928, 1 year 270 days after the resistance test. The autopsy showed no sign of tuberculosis and guinea-pigs inoculated with emulsions of the thoracic, mesenteric and prescapular glands did not become tuberculous.

The heifer (Calf B) was sent to the bull on Sept. 16th, 1927; she was then in excellent health and condition. On June 27th, 1928, she gave birth to a healthy calf which was brought up on the mother's milk. Two months later the calf did not react to the double intradermal test or to an intravenous injection of 10 mg. of B C G and was used for an immunity experiment (see calf D, The Lancet, 1931, i., 393).

Two months before full term some mammary secretion from each of the four quarters of the udder of the heifer was withdrawn and tested for the presence of tubercle bacilli. No colonies of tubercle bacilli were obtained on culture tubes and a guinea-pig inoculated with the secretion remained healthy.

Before calving the heifer became weak in the hind limbs; the weakness, I thought, was traumatic and caused by the bullock who lived in the same paddock. After calving she became weaker, and on August 20th, 1928, i.e., two years after the test dose, she was slaughtered. At the autopsy no sign of tuberculosis was found anywhere.

There is, of course, nothing new in the production of immunity in cattle against tuberculosis by the inoculation of living tubercle bacilli. The experiments of numerous observers have shown that by the inoculation of living cultures of human, avian, or—in small doses—bovine tubercle bacilli, or of attenuated strains of any of these three types, the specific resistance of a bovine animal can be raised sufficiently to protect it against the inoculation of a dose of bovine bacilli which is capable of setting up severe and fatal tuberculosis in an animal not so protected.

The use of living tubercle bacilli which have some pathogenicity is, however, inadmissible, since it has been shown that the bacilli may be excreted in the milk, or may remain alive for long periods in the tissues or, in the case of attenuated strains, may regain their virulence,[8] [9] and thus be the means of propagating tuberculosis from cattle to man.

B C G is an attenuated strain of the tubercle bacillus, but it is claimed by the originators that this strain is incapable of causing progressive tuberculosis in man or any species of animal or of regaining its original virulence during long stay in the human or the animal body. This claim is supported by the results of the researches of the majority of tuberculosis workers.

On the other hand, a few investigators are not in agreement with the view that B C G may be regarded as certainly free from all danger to man and animals. For example, Watson and his collaborators,[15] and Uhlenhuth and Seiffert[16] believe that B C G has sometimes produced progressive tuberculosis in guinea-pigs. Petroff, Branch and Steenken[3] claim to have dissociated a virulent element from an original culture. Dreyer and Vollum[17] believe that the culture may acquire virulence when grown in the depth of broth. Sasano and Medlar[18] report that they have obtained a virulent strain by growing B C G on the surface of broth. Komis[19] thinks he has succeeded in rendering B C G virulent by means of fermentation with wine yeast.

Attempts to Attenuate Tubercle Bacilli by Growing them on Bile Media.

In their first paper on the subject Calmette and Guérin[20] make the interesting statement that the bovine strain, eventually to be named B C G, after a single subculture on bile potato exhibited a little higher virulence for the guinea-pig than the same strain of bacilli which had been maintained on ordinary potato. Guinea-pigs inoculated intraperitoneally with 1·0 mg. of the bile bacilli always died within 18 days as in the mammal, but apparently under voluntary control. Most of the visible vessels are part of a large capillary plexus covering the sphincter on a background of pigment which is of very various colours in different species. Reptiles and amphibia exhibit their own peculiarities; metallic pigment is often present and there is a protective colour-striping of the whole head involving the lids, conjunctiva, and iris stroma. This is especially well seen in snakes. In frogs the shape of the pupil has different outlines according to the particular species, and in many species the shape alters with the illumination—for instance, from pear-shaped to heart-shaped, dilating to a complete circle in very dim light. In fish there is a remarkable brilliance of coloration and many fish, such as the salmon, have a notch on the inner side of the pupil, not a true coloboma, but displaying an aphakic area such as in human beings is seen in cases of dislocated lens.

There are many other peculiar varieties in the vertebrate iris which may be studied in this fascinating work. One is seen in the gecko, a specialised form of lizard. These animals are nocturnal hunters, but in the day sit basking on tree trunks in full sunlight. In dull light the pupil dilates widely to a complete circle. In bright sunlight it narrows to a long vertical line and appears to be completely closed. On careful examination, however, four small diamond-shaped openings in the slit can be discovered. These allow good vision in daylight without dazzle and with a wide vertical field of vision. With a normal lens the four rays of light would all be focused on the same point in the retina, so that single vision would result.

WEATHER CHANGES AND HEALTH.

We hope that the new Section of Physical Medicine of the Royal Society of Medicine will be stimulated rather than depressed by the chilly agnosticism which the director of the Meteorological Office brought to its first meeting.[1] Dr. Simpson maintained that the only important influence which weather had on the body is its extraction of heat. In most rooms in this country, he said, enough air exchange is effected to obviate any ill-effects, and those of us who become depressed when the windows are closed must consider our symptoms "chiefly psychological." In a letter this week Fleet-Surgeon W. E. Home welcomes this point of view as preferable to the old and discouraging idea that tropical diseases were due to climate. At the same time he records interesting observations about the relation between air humidity and illness, and it seems a pity that curiosity on such points should be rare, except, apparently, among members of the Home family. Close investigation might reveal more justification for the layman's steady belief in a connexion between bodily and climatic changes. It has been noticed, for instance, that colds and chills more commonly follow a change towards warmer than towards cooler weather, and Dr. K. Stotle,[2] of Breslau, has lately tried—though not with much success—to explain this paradox in the medical language of our time. In the first place he records how children who have remained healthy throughout the winter contract tonsillitis or nasopharyngitis with the first warm days of spring although there is no reason to suppose they have been chilled. He further points out how common it is for town children sent to convalescent homes in the country to develop coughs and colds within a few days of arrival, although their surroundings are much improved. Again, he says, it is well known that tuberculous meningitis grows commoner in spring. The increase does not occur at any constant month, and has nothing to do with poor nourishment and bad surroundings during the winter, for it is seen in all classes. While usually appearing from the middle of February to the middle of April this increase of acute tuberculous affections in childhood was delayed in 1931 until May, owing to an exceptionally long winter. In other words, it is the first warm days of spring which appear to be the climatic factor rather than the lack of sun during the winter months. Seeking for some explanation of these observations Stotle points out that in children the maximum period of growth takes place during spring, and he thinks that in this increase in new cells lies the possibility of decreased resistance to disease. Further, he remarks that ultra-violet radiation produces definite alterations in the mineral content of the blood—as shown in its extreme form in rickets—and such biochemical changes, especially as they affect the water content of the tissues, may well be associated with alterations in resistance to infection.

Mr. Wilfred Trotter, F.R.S., will deliver the Hunterian Oration before the Royal College of Surgeons of England at 4 P.M. on Monday, Feb. 15th. His subject is the Commemoration of Great Men.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE.

Surg. Comdr. J. D. Murphy is placed on the retd. list.

The following appointments are notified: Surg. Lt.-Cmdrs. R. W. Mussen to *President* for Naval Medical School, Greenwich; and E. R. Sorley to *Malabar* for Bermuda Hospital.

ROYAL NAVAL VOLUNTEER RESERVE.

Proby. Surg. Sub.-Lt. J. D. Spillane to be Surg. Sub-Lt.

Proby. Surg. Lt. (D). E. N. F. Jenkins to *Victory* for Haslar Hospital.

ROYAL ARMY MEDICAL CORPS.

Maj. W. J. F. Craig, from the secd. list, is restd. to the estabt.

Lt. (prov. Capt.) J. W. Kendall half-pay list, relinquishes the prov. rank of Capt.

D. P. F. Mulvany from a temp. commn. to be Lt.

TERRITORIAL ARMY.

Lts. H. A. Bulman, A. Roberts, and F. Lawence to be Capts.

ROYAL AIR FORCE.

Medical Branch.—The undermentioned are granted short service commissions as Flying Officers for three years on the active list: F. W. P. Dixon, C. R. Palfreyman, J. A. Kersley, D. C. MacGilchrist, C. A. Rumball, and A. M. Weston.

Flight Lt. A. S. Burns is granted a permanent commission in this rank.

Squadron Leader H. B. Troup is placed on the retd. list on account of ill-health.

INDIAN MEDICAL SERVICE.

Capt. (prov.) C. K. Lakshmanan is confirmed in his rank.

Lt. J. F. Shepherd to be Capt.

DEATHS IN THE SERVICES.

Lt.-Col. Samuel Forster Lougheed, C.M.G., R.A.M.C.; retd., who died on Feb. 4th at the age of 72 was the son of the late S. Lougheed, of Ballinakill, Co. Sligo, Graduating M.D., R.M.I., in 1881, he entered the Army in the following year and served throughout the South African War from 1889 to 1902 (mentioned in despatches, Queen's Medal with three clasps and the King's Medal with two clasps). He received the C.M.G. in 1900.

His wife, who pre-deceased him in 1920, was the daughter of the late C. Hammerton, of Horsham.

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[1] See The Lancet, Jan. 30th, p. 242.

[2] Jahrb. f. Kinderheilk., 1931, cxxxiv., 6.

inoculation or in the adjacent glands; the anterior lobes of the lungs, however, each contained a caseous mass, that in the right being the more advanced; the bronchial glands, particularly the right, were much enlarged and caseating; the spleen contained caseating nodules and the liver grey tubercles. A highly dysgonic culture was obtained from the bronchial glands.

These two guinea-pigs had been put, through a misinterpretation of instructions, in a house containing guinea-pigs infected with mammalian tubercle bacilli.

3. A guinea-pig, one of another pair which had been inoculated with deep broth cultures of B C G. The cultures were seven months old (little if any multiplication had occurred) and the growth from one flask was injected intraperitoneally into each guinea-pig.

One guinea-pig was killed 82 days later and showed a pea-sized abscess in the omentum from which B C G was not recovered in culture. The other died of pleural effusion in 79 days. The omentum and the mesenteries were thickened and contracted and adherent to surrounding structures, the omentum containing an abscess; there were numerous small yellowish-white caseous masses on the visceral peritoneum, many loosely attached by fine fibrous strands: there was deposit of a similar nature between the liver and the diaphragm. The sternal and manubrial glands were a little enlarged and opaque. There were no tuberculous lesions in the spleen, liver or lungs. The mid-cervical gland on the right side was enlarged and composed throughout of firm creamy caseous substance: no other gland was affected in this way. Microscopically the caseous substance from the abdomen showed numerous beaded tubercle bacilli. Numerous egg and glycerin egg tubes sown from abdominal pus, the sternal and manubrial glands remained sterile. An emulsion of sternal gland did not produce tuberculosis in a guinea-pig.

A culture of tubercle bacilli was obtained from the cervical gland. The culture was dysgonic, though not highly so. Two guinea-pigs were inoculated subcutaneously, each with 1·0 mg. of the culture. One killed 101 days later showed general tuberculosis of a mild type. The other died in 150 days of severe chronic general tuberculosis. These guinea-pigs lived longer than is usual for guinea-pigs inoculated with 1·0 mg. of fully virulent bovine bacilli. A rabbit inoculated intravenously with 0·01 mg. of the culture died in 33 days of severe general miliary tuberculosis.

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MEDICINE AND THE LAW.

Hospital Benefits by Subscription.

THE Assurance Companies Act of 1909, in this respect superseding an older enactment of 1870, requires that persons or bodies carrying on life insurance in the United Kingdom must deposit in court a sum of £20,000, to be invested in approved securities. The obvious purpose of this requirement is to make sure that such undertakings are solid, solvent, and permanent, so that anyone who thriftily pays his premiums year after year shall not find his security suddenly vanish when he most needs it. The question has lately arisen whether the British Provident Association for Hospital and Additional Services is within the statute, and is therefore obliged to make the £20,000 deposit. The Association was formed in 1923 to recoup to its subscribers their expenses in hospitals and nursing homes or in respect of surgical operations. It has no share capital; it is a company "not for profit." Its articles of association allow no dividend or bonus to be paid to members; in the event of its dissolution, surplus funds are to go to charitable purposes. Its prospectus invited subscriptions and described the financial help which subscribers would receive towards the expenses already described and the limits of amount and duration. Every subscriber received a card explaining the amounts due from him; it warned him that the amount of benefit depended on the amount subscribed and on the calls for contributions made on the Association. Subscribers were given no policy of insurance; indeed the memorandum of association expressly provided that the Association was not to conduct insurance business.

A friendly test action was brought before Mr. Justice Farwell, who has held that the Association is carrying on a charitable business, is not issuing insurance policies, and is outside the statutory requirement as to depositing £20,000. He did not regard the combined effect of prospectus and subscription as a policy; it was merely a contract to pay benefits according to the undertakings in the prospectus. The operations of the Association therefore are neither illegal owing to the omission to deposit £20,000, nor ultra vires owing to breach of the provision in the memorandum which stipulates that the Association shall not conduct insurance business.

IRELAND.

(FROM OUR OWN CORRESPONDENT.)

AMALGAMATION OF HOSPITALS IN DUBLIN.

THE Charter Day dinner of the Royal College of Surgeons in Ireland was held in the College Hall last Saturday, with Mr. Richard Atkinson Stoney, the President, presiding. There was a large number of guests, the principal being Mr. James McNeill, Governor General of the Irish Free State. The President in his speech dealt with the question of amalgamation of the Dublin hospitals in a rather critical spirit. As Mr. Stoney has hitherto been a supporter of the project of amalgamation his present views are likely to attract attention. It is true that he warned his hearers against the assumption that he was necessarily opposed to amalgamation in any form, but there was danger that in grasping at a shadow the Dublin hospitals might lose many real advantages which were inherent in their present system. Moreover, the expense of building and equipping an amalgamated hospital of sufficient size to be worth while would require—at a rate of £1000 a bed—from half a million to a million pounds, and the scrapping of the present hospitals would be a very wasteful procedure. He went on to direct attention to certain advantages of the present system, which he thought would be lost if the hospitals were amalgamated into one or two large hospitals. First he placed the custom existent in Dublin of receiving medical students as "resident students" in the hospitals, thereby accustoming them, before qualification, to dealing with patients with a certain degree of responsibility. He regarded the rivalry between a number of small teaching hospitals as healthy in that it stimulated the teachers to make sure that their teaching was of the best if they were to attract students and keep up a good class. Again, by the system of small hospitals the clinical classes were kept comparatively small so that the student could receive individual attention and teaching. From the point of view of the patients, it was of advantage to have the hospitals scattered widely over the city so that they were easy of access.

Mr. Stoney, however, gave no reason for his view while guinea-pigs inoculated with the same dose of the same strain on potato survived for periods of from 20 to 45 days.

Two tests were made by me with the Pasteur Institute strain of bovine bacilli, named "Bovine Vallée," on media with and without bile.

Experiment 1 (July, 1931).—Two guinea-pigs were inoculated intraperitoneally with 1·0 mg. of the strain grown for 35 days on a 5 per cent. glycerin bile egg tube. At the same time two guinea-pigs were similarly inoculated with a 35 day old culture of the strain on plain egg. The guinea-pigs inoculated with the bile culture died of subacute general tuberculosis in 36 and 42 days. The guinea-pigs inoculated with the plain egg culture died of acute tuberculosis in 12 and 19 days.

Experiment 2 (September, 1931).—As above with the exception that the cultures used were 28 days old. The guinea-pigs inoculated with the bile culture died of general tuberculosis in 23 and 21 days while those inoculated with the plain egg culture died in 19 and 26 days, one of acute, the other of subacute general tuberculosis.

These experiments showed that after single sub-cultures on glycerin bile egg the strain "Bovine Vallée" was not of higher virulence for guinea-pigs than the same strain grown on plain egg.

On the other hand, these authors[2, 21] stated that when successive subcultures were made on bile media the bacilli instead of further increasing in virulence became attenuated at each passage. After 15 passages the bacilli in doses of 1·0 mg. intraperitoneally caused "une tuberculose viscérale compatible pendant plus de cinq mois avec les apparences d'une bonne santé sans amaigrissement." The same inoculation under the skin provoked a slow enlargement of the neighbouring gland; sometimes an abscess formed at the seat of inoculation which opened and then healed. The affection showed no tendency to generalisation. After 42 passages when the strain had been cultivated on bile media for a period of about four years the bacilli appeared to be stablised in virulence for the guinea-pig.

Calmette and Guérin further state that the bile culture of the forty-second passage, although incapable of causing general progressive tuberculosis in the guinea-pig, was extremely virulent for the horse. Two horses aged 3 and 14 years received 5·0 mg. intravenously and succumbed respectively 55 and 73 days later with "des lesions énormes de granulie pulmonaire."

For bovines there was the same march of decreasing virulence as was observed for the guinea-pig. At the second passage 5·0 mg. intravenously provoked a typho-bacillosis without follicular lesions. At the tenth passage a dose of 50·0 mg. was necessary and at the fifteenth 100·0 mg. caused a general disease "d'allure typhique" which was rarely fatal and never accompanied by the formation of lesions.

It was evident from the pathogenic history of the strain that already after only 15 subcultures on bile media, extending over a period of about one year, the strain was no longer capable of producing progressive tuberculosis in calves and guinea-pigs.

In order to ascertain whether other strains of the tubercle bacillus could be as readily modified in this way I began in 1925 the serial cultivation of two strains, one of bovine and one of avian tubercle bacilli, and at a later date added three further strains of bovine and one of human bacilli. These six strains have now been continuously subcultivated on bile media, the transfers being made every two to three weeks, for periods ranging from four to six years. The bile media used have been potato soaked in 5 per cent. glycerin ox-bile and 5 per cent. glycerin egg to which was added before inspissation 10 per cent. (in the early experiments, 7·5 per cent.) ox bile.

The cultures of mammalian tubercle bacilli on the bile egg medium are strikingly different from those on egg without bile. Instead of being dry, coherent, and difficult to emulsify, they are soft, moist, and easily emulsified. After two to three weeks' incubation the growth is shiny, moist, and translucent. On further incubation the growth thickens, becomes opaque, acquires a creamy or a buff colour, and closely resembles a layer of thick paint unevenly spread. In old cultures secondary colonies appear on the surface; in the case of four strains these were minute while in two they were large and varied in form, some being widespread and warty or wrinkled, some heaped up and nodular or umbilicated or crateriform.

On ox bile potato human and avian strains grow as freely as bovine strains and produce very similar growths. After from four to six weeks the growths are moderately thick, opaque, greyish, slightly or definitely creamy and warty on the surface. On magnification they are seen to be composed of small closely aggregated and super-imposed pearly grey colonies. The growth is moist and easily spread.

On transference to ordinary media the bile cultures of mammalian tubercle bacilli again produce dry coherent growths. The modification of cultural characters caused by cultivation on bile media is therefore not permanent.

The virulence of the bile strains has been tested at intervals. All the mammalian strains are still virulent and capable of producing progressive tuberculosis in the guinea-pig after from four to six years' cultivation on bile media; also the avian strain is virulent for the fowl. One strain only, No. 4 bovine virus, after 1308 days on bile media is definitely reduced in virulence, producing in guinea-pigs and rabbits a much more chronic form of tuberculosis than the same strain maintained on egg. This bile-cultivated strain recovered from the chronically infected guinea-pigs produces a severe form of tuberculosis in other guinea-pigs so that one cannot yet speak of a permanent attenuation of the strain. The passage experiments on bile media with the six strains are being continued.

Spontaneous Tuberculosis in Animals Inoculated with B C G.

Rabbits and guinea-pigs inoculated with B C G were, as a rule, kept apart from animals infected with virulent tubercle bacilli. For various reasons this rule was sometimes broken and a few animals were put into houses containing tuberculous animals. As a result one rabbit and two guinea-pigs contracted spontaneous tuberculosis.

1. The rabbit had been inoculated intravenously with 20 mg. of B C G and was killed 460 days after inoculation. The autopsy showed numerous caseous lesions in the lymphoid tissue of the appendix and a few in the solitary follicles of the cæcum. At the back of the left orbit there was a caseous abscess (of periosteal origin) and the left lachrymal gland was almost replaced by caseous nodules. The lungs were crepitant and showed a few minute grey foci. Typical avian cultures were obtained from the appendix, colon, lachrymal gland and orbital abscess. Two fowls inoculated subcutaneously with 15 mg. of one of the strains died in 49 and 52 days of general miliary tuberculosis.

The avian infection in this rabbit was, I think, acquired from two rabbits living in the house at the same time which had been inoculated with a strain of avian tubercle bacilli from a kangaroo.

2. A guinea-pig, one of two which had been inoculated with deep-broth cultures of B C G. Six flasks of broth were inoculated, each with the young growth from one glycerin egg tube, and were incubated for three or more months. There was no apparent multiplication of the bacilli except perhaps in one flask. The granules of culture were collected, emulsified and inoculated subcutaneously into two guinea-pigs which were killed 111 days later. One was found to be perfectly normal. The other showed nothing at the seat of

claimed $175,000 from the estate of one Alexander J. Derbyshire. They lost their suit in the Supreme Court. In 1913 they made another unsuccessful attempt. Now at last they succeed through a new legislative enactment. The property has been increasing in value during the last 50 years and the hospital is richer by more than three million dollars.

THE LÜBECK TRIAL.

(FROM OUR BERLIN CORRESPONDENT.)

(*Concluded from p.* 260.)

THE CASE FOR THE DEFENCE.

COUNSEL for Dr. Altstädt said that his client had gone to Berlin where (he stated) in the Robert Koch Institute B C G was cultivated in a room easily accessible from other rooms of the laboratory; and yet his client was held responsible for the same condition in Lübeck. The death of the first victim—infant G—was not a sufficient reason to stop the further application of the Calmette method as suggested by the public prosecutor. Not his client alone, but other physicians too had believed that that death had nothing to do with the B C G, but was due to congenital tuberculosis. His client had certainly believed B C G to be a virus fixe, but other physicians not concerned in the disaster shared that opinion. Whether that opinion was right or wrong the trial had not decided, but it was the holding of that opinion which had led Dr. Altstädt to introduce the Calmette method in Lübeck. He should not be punished for manslaughter by negligence on account of a possible error on a scientific question. He therefore pleaded for a verdict of not guilty.

Counsel for Prof. Deycke described his client as a man who had devoted his whole life to the welfare of humanity. As a young assistant at the Hamburg General Hospital he had discovered, by bacteriological research, the first cases of cholera at the beginning of the great epidemic of 1893 in that city, and his discovery had contributed to early preventive measures. He had been of opinion that B C G was innocuous and could by no means become altered, a point of view shared, not only by Prof. Calmette, but by medical science in general. Prof. Deycke now regretted that he had not considered Dr. Petroff's contrary opinion, the reason being that these experiments were not believed to be reliable. He was still convinced that contamination of cultures in his laboratory was impossible, and not in point of fact ascertained by the evidence submitted. Prof. Lange, who assumed contamination had come to that view by holding the theory of B C G being invariable—a theory which was beginning however to fade. The court, he said, ought to consider whether the belief that B C G was a virus fixe could be regarded as negligence under the law, all the more as medical experts differed over it. The great number of experts was a special feature of the trial and there was no single question on which they all agreed. He was of opinion that the non-existence of a special laboratory for which his client was especially blamed had nothing to do with the disaster. Finally, in his client's name, he protested against the attack on Prof. Calmette made by counsel for the parents. He asked for a verdict of not guilty.

Prof. Deycke was then allowed some final words. He had nothing, he said, to add to his counsel's remarks; it had been his ill fate to kill and injure many children in the desire to protect them against sickness. If the court came to the conclusion that the disaster had not been caused by force majeure, but by his negligence he was willing to suffer punishment. He begged the court to pronounce a verdict of not guilty for his associates.

THE SENTENCE.

The trial which began on Oct. 13th came to an end on Feb. 6th when sentence as pronounced. Prof. Deycke and Dr. Altstädt were both found guilty of manslaughter by negligence in 68 cases and of injury by negligence in 131 cases; they were sentenced to two years and one and a half years imprisonment respectively. Prof. Klotz and Nurse Schütze were found not guilty and acquitted, the charges against them not being sufficiently proved. In pronouncing the judgment of the court the presiding judge said the court had been convinced that although according to the opinions of some experts B C G vaccine may, under certain conditions, become virulent, the disaster had actually been caused by an exchange of B C G with other virulent bacilli or by contamination. The negligence was found in the fact that Prof. Deycke had prepared the culture in a laboratory where such contamination or exchange was within the reach of possibility. Dr. Altstädt, as director of the Lübeck Health Department, had acted negligently in not having the cultures tested before distribution to patients, and in not immediately stopping that distribution as soon as he had been informed by Prof. Deycke that something was wrong with them.

The sentence was heard by the numerous audience with strong emotion, Prof. Deycke being very popular in Lübeck as a conscientious physician and a member of one of the oldest families in the Hanseatic city.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED JAN. 30TH, 1932.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 49 (last week 55); scarlet fever, 1586; diphtheria, 1039; enteric fever, 36; pneumonia, 1557; puerperal fever, 22; puerperal pyrexia, 114; cerebro-spinal fever, 36; acute poliomyelitis, 8; acute polio-encephalitis, 1; encephalitis lethargica, 20; dysentery, 21; ophthalmia neonatorum, 79. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on Feb. 2nd–3rd was as follows: Small-pox, 110 under treatment, 3 under observation (last week 124 and 6 respectively); scarlet fever, 1182; diphtheria, 1479; enteric fever, 10; measles, 780; whooping-cough, 331; puerperal fever, 16 (plus 10 babies); encephalitis lethargica, 222; poliomyelitis, 4; "other diseases," 275. At St. Margaret's Hospital there were 20 babies (plus 13 mothers) with ophthalmia neonatorum.

Deaths.—In 117 great towns, including London, there was no death from small-pox or enteric fever, 39 (14) from measles, 6 (2) from scarlet fever, 39 (5) from whooping-cough, 32 (6) from diphtheria, 25 (3) from diarrhœa and enteritis under two years, and 313 (86) from influenza. The figures in parentheses are those for London itself.

The deaths from influenza show a marked drop from the previous week. The total for the year so far amounts to 1458, against 795 for the corresponding period of 1931. Of the great towns Birmingham stands this week much higher with 21 deaths from influenza, Bradford reports 9, Croydon, Liverpool, and Manchester each 7. Manchester reported 6 deaths from measles, Liverpool reported 9 deaths from whooping-cough, Birmingham 7. Diphtheria accounted for 3 deaths each at Blackpool and Salford.

The number of stillbirths notified during the week was 263 (corresponding to a rate of 42 per 1000 births), including 40 in London.

that the principal educational advantages which he attributed to the present system could not be as easily maintained under a system of amalgamation. It is clear, on the other hand, that with a larger body of students to deal with in a particular institution they could be better organised with study groups according to their standing and experience. The absurdity of attempting to teach students in their first hospital year and those preparing for their final examination in the same class would, for example, be avoided. Again, it will occur to many that the slight advantage accruing to the patients from ease of access to a hospital—not a matter of much importance in a compact city like Dublin possessed of a good transport service—is much more than counterbalanced by grave disadvantages. With hospitals of small size diagnosis and treatment are delayed by the impossibility of having at hand an adequate auxiliary staff. The hospitals are adequately—if not excessively—staffed by physicians and surgeons, each of whom, however, by lack of access to a wide field of experience, is debarred from gaining a special knowledge or skill in any special department of medicine or surgery. But the services of a pathologist, of a radiologist, of a biochemist, of an ophthalmic surgeon, of a laryngologist, have to be divided according to the days of the week between two, three, or more hospitals. Not only delay, but relative inefficiency is inevitable, for the physician or surgeon finds it difficult if not impossible to have personal interviews with the specialists to whom he looks for help.

UNITED STATES OF AMERICA.

(FROM AN OCCASIONAL CORRESPONDENT.)

NATIONAL HEALTH.

REPORTS for the fiscal year 1931 are now coming to hand. Two of these[1] give evidence both of the state of national health and of the efforts being made to improve it. The public health service can boast of a good calendar year 1930 with record low death-rates for tuberculosis (68·5) and diphtheria (4·9) and in most respects a good beginning to 1931. A slight increase of pellagra in the first six months of 1931 (16,385 cases as compared with 13,359 in the corresponding period of the previous year) may possibly be related to the economic depression. "Many requests have reached the Public Health Service for authoritative information as to the effect of the present economic situation upon the public health." The surgeon-general regrets that more complete and comprehensive information could not be supplied, and adds significantly: "It will be recalled that recommendations have been made for several years past that a small appropriation be made for the purpose of developing and stimulating better reporting of the notifiable diseases."

Almost 20,000 passengers and 1597 seamen were certified at domestic ports to be suffering from contagious disease, mental defect, or insanity. Those who have condemned the stringency of the Immigration Act of 1917 will find some excuse for it in the detailed figures here presented. No less than 340 cases of trachoma and 596 cases of venereal disease were discovered among the passengers examined. At European ports of embarkation 41,737 passengers were vaccinated and 38,639 were deloused.

The report of the division of scientific research discloses an astonishing amount of important work now in progress. With specially designed physical apparatus studies are about to be made on the biological action of the whole spectrum of radiation from the highest frequency X rays to electromagnetic radiation. It is hoped of course that some results of practical value in the treatment of cancer may be obtained. Our knowledge in this field is certain to make an important advance. A large programme of biological research in cancer must be added to the above physico-biological programme. It includes studies of resistance and immunity, of the biochemistry of malignant cells, and of susceptibility to malignant growths. All research workers in cancer will wish to inform themselves in detail from this interesting report of the plans and progress of the "office of field investigations of cancer" housed at the Harvard Medical School. The results of some other investigations of the public health service, as for instance, the studies on Rocky Mountain spotted fever, have already been described in my letters.

The report of the chief of the Children's Bureau is also charged with accounts of scientific investigation. A study of 7537 maternal deaths in 15 States shows plainly the correlation between deaths from "albuminuria and convulsions" and lack of prenatal care. It also shows that the value of prenatal care is little appreciated. Less than 1 per cent. of 4570 women who died in childbirth or in the last three months of pregnancy had received "really adequate" prenatal care. A study of neonatal deaths lays much emphasis on the importance of prematurity as a cause, but does not consider (at least in this report) the possibility that an hereditary or early developmental defect may be the cause both of prematurity and of neonatal death. Studies on the influence of the economic depression show that family relief expenditures in American cities increased 89 per cent. in 1930 over those of the previous year. In certain localities depending upon coal mining and small industries it is found that "local public and private resources . . . are quite inadequate . . . to meet the needs of the children of the unemployed or under-employed men." The report contains a very complete account of State legislation (both successful and attempted laws) which deal with children, including child labour, minimum age of marriage, and juvenile courts.

COMPULSORY HEALTH INSURANCE AT A UNIVERSITY.

The principle of health insurance is implicit in a scheme for health service to staff and employees of the clinics group at the University of Chicago, approved by the board of trustees. One dollar a month is to be deducted from the salaries of all employees for their expense of this service. Operations for the removal of defects discovered at the time of employment are not included in the service. But defects found at this time if they are liable to interfere with proper performance of duties, must be remedied within three months at the employee's own expense or on their own responsibility. After one year's employment under the scheme defects will be remedied free of charge. Two months' hospital care and treatment for conditions usually treated in the University of Chicago clinics is included in the benefits. All employees appointed or reappointed after Dec. 1st, 1931, are obliged to participate in the scheme.

WINDFALL IN PHILADELPHIA.

The Pennsylvania Hospital has received a windfall which should be welcome at this time. In 1879 they of a systematic effort in Scotland to search out the flaws in the Insurance Acts. Some insurance practitioners have protested against the implied criticism and their protest may have considerable force. But when the incidence of certified sickness assumes the proportion of one in two of the lives at risk, certain questions suggest themselves: first, is this a genuine excess or is it due to too facile certification? Secondly, is the insurance system made to carry too heavy a load? There is a third question: How can the insured person secure the value of the public hospitals and clinics, official and voluntary, without being taxed twice? These are fundamental questions, and it will be interesting to watch how the Scottish Department will develop its methods of solving them. When the figures already collected are set forth in a full public document we shall possess genuine data for an estimate of the whole system.

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[1] Annual Report of the Surgeon-General of the Public Health Service, 1931. Pp. 354. 85 cents. Nineteenth Annual Report of Chief of Children's Bureau to the Secretary of Labour. 1931. Washington: Govt. Printing Office. Pp. 68. 10 cents.

A Conference on Certification in Rutland.

Medical practitioners in Rutland met representatives of approved societies at a conference held recently at Stamford, and reported in the *National Insurance Gazette* for Jan. 30th. It was decided not to discuss memorandum 329 I.G. as a whole, but to consider a few contentious points in administrative procedure. The chairman of the conference has summarised the discussion under headings, of which we quote the following:—

RELATIVE INCAPACITY.—The case of an insured person normally engaged in heavy work—e.g., an ironstone quarryman, who is incapable of that work and in receipt of benefit, but who has entered a stage of convalescence.

Answer: It appeared that societies would welcome information from practitioners when an insured person has so far recovered as to be able to do light work, although unfit for his usual occupation, and that practitioners could convey this information to societies in these cases by using the remarks space on medical certificates.

ANY WORK TO GO TO?—Should a doctor have any regard to the point as to whether a patient has any work to go to on recovery from illness?

Answer: It was considered that the practitioner should have no regard as to whether a patient has work to go to on recovery from illness.

SUSPECTED MALINGERING.—In cases of doubtful incapacity for work or suspected malingering, would medical practitioners prefer to reply to an inquiry from the society before the society refers the case to the regional medical officer?

Answer: It appeared that the medical practitioners would be willing to reply to such an inquiry, although it was remarked that this would entail further clerical work on the practitioner, which was undesirable.

REFERENCE TO R.M.O.—Having regard to the fact that practitioners can refer cases to the regional medical officer without payment of a reference fee, whilst a society has to pay 1*s*. 6*d*. in every case, could practitioners be induced to make greater use of the regional medical officer?

Answer: Several members of the medical profession stated that they were unaware that societies were subject to the charge mentioned in respect of references made by them. References by practitioners necessitated completion of a somewhat lengthy form and again increased clerical work. Some practitioners inserted the words "Refer to R.M.O." on certificates, but some societies took no action on this remark. It was felt that further precautions should also be taken by all concerned to ensure that the patient did not become aware as to whether he was referred by the society or the practitioner.

THE SICK VISITOR.—Medical certificates are to be regarded by societies as part evidence of incapacity only, and the society is under an obligation to satisfy itself that incapacity does exist—i.e., calls by sick visitor.

Answer: It appeared that this point was raised in order to acquaint medical practitioners of this obligation placed on societies as it was considered that, in the absence of knowledge on this point, there was a danger of offence being taken by practitioners against a duty which societies are called upon to perform.

Range of Service and Emergency Treatment.

Addresses are being given this winter in London to students and recently qualified men on insurance practice by lecturers thoroughly conversant with all the ramifications of the regulations. Dr. E. A. Gregg addressed U.C.H. men, and Dr. A. F. Heald St. George's men in December, and last month Dr. R. G. Chase gave a lecture at St. Bartholomew's Hospital which was reported in the Supplement of the *British Medical Journal* for Jan. 23rd. Dealing with the range of service in insurance practice this included, he said, all proper and necessary medical services other than those requiring special skill or experience of a degree or kind which general practitioners could not, as a class—that last phrase was important—reasonably be expected to possess. Those to whom he was speaking, he remarked, were about to go out into general practice with a knowledge of the latest methods of diagnosis and treatment, but the position of the older qualified men had to be remembered, men who had been in practice for many years, and who, perhaps, were not familiar with the latest methods. The range of service implied, not that which a particular man was capable of undertaking, but the kind of service of which general practitioners as a class were capable. A necessary qualification to this, however, was emergency treatment. In an emergency the practitioner might be called on for quite exceptional services. For example, in a case of laryngeal obstruction, it was the practitioner's duty, assuming, of course, that there was no possibility of getting the patient into skilled hands in time to save his life, to do a tracheotomy, whether he had special skill or not. Dr. Chase recalled the case of a doctor—a capable surgeon—who reported on the usual form that he had operated on a case of appendicitis which was of an urgent character. But he was not allowed to charge for the operation, because, although it was one beyond the skill commonly possessed by the general practitioner, he had reported it as an emergency.

Insurance Practitioner as Social Reformer.

Dr. G. de Swietochowski regards[1] the insurance medical service as the chief agency of social reform in the near future. Doctors, he says, have the best qualifications that men can have to make successful leaders amongst social reformers. They are intimately associated with large numbers of people, the character of the relationship being naturally a friendly one and at the same time a confidential one; they have the education and standing; above all they have the confidence of millions of people whose needs they know well, and they have the power to say and do things like no other men in the country. More use, he thinks, should be made of the link which has been established between the doctors and the government through the national health insurance system in order to introduce new methods and break with the old ones. The support of the government should enable insurance practitioners to exercise a gentle

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[1] Presidential address to the Paddington Medical Society reprinted from the Medical World of Dec. 11th, 1931.

PANEL AND CONTRACT PRACTICE

A State of Mind.

WHILE so much is being written in letters to our journals, in official memoranda, and in leading articles, about the sins of commission and omission on the part of approved societies or practitioners, the point of view of the insured person has nowhere been stressed. In his recent valuation report the Government Actuary impressed on the authorities responsible the importance of stricter supervision over certificates and claims for sickness benefit. He implies that we must get back to a standard level, and he indicates that the experience of ten years ago is a fair standard to work to. The question is, Can it be done? Such a view regards the present economic stress as a temporary phase, and assumes that we shall return to an era of prosperity such as the fat years 1921–23. But who is to say how much of the change in our economic life is permanent; has there not been concurrent change in mind and outlook of the people? It is not merely the doctors and the approved societies who are concerned in the question of increased claims for either sickness or unemployment benefits. People are claiming more frequently than they used to do, and not only of necessity. Ideas have changed. Claims are made as a right. The community or State is looked to for help when distress is caused by changes in economic conditions. So with health. People are exhorted to be healthy and provided with the means to do so in public health services. Why, it is argued, does not the State go further and provide something for economic loss. In this state of mind they do not regard their claims either on sickness or unemployment funds to be improperly made. The pressure of insured persons has greatly increased, and this point is stressed in the answer made by the Insurance Acts Committee to the Government memorandum, when reasons were given for asserting that the most important cause of the increase in sickness claims is the larger proportion of those who rightly claim to-day in comparison with those who claimed, say, ten years ago. The main factors in this change of mind are briefly:—

Propaganda by insurance committees and others, showing the wisdom of exercising rights.

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Finally, there is the higher standard of what constitutes health on the part of the whole community, which applies especially to pregnancy and the post-partum period.

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The Scottish Department has issued a circula letter to insurance practitioners asking for the coöperation in exploring methods for the reductio of this unprecedented sickness. Many new fact have already been brought to light by the inquiry— e.g., the frequency of incapacity for work at the earlie ages. Here is a problem for detailed research. It recognised that the frequency in the issue and duratio of claims must vary from factors outside the contro of practitioners, and a few areas where this variatio is greatest are to be specially investigated. Th letter must be regarded as an administrative documen of the first importance, marking indeed the beginnin of a systematic effort in Scotland to search out the flaws in the Insurance Acts. Some insurance practitioners have protested against the implied criticism and their protest may have considerable force. But when the incidence of certified sickness assumes the proportion of one in two of the lives at risk, certain questions suggest themselves: first, is this a genuine excess or is it due to too facile certification? Secondly, is the insurance system made to carry too heavy a load? There is a third question: How can the insured person secure the value of the public hospitals and clinics, official and voluntary, without being taxed twice? These are fundamental questions, and it will be interesting to watch how the Scottish Department will develop its methods of solving them. When the figures already collected are set forth in a full public document we shall possess genuine data for an estimate of the whole system.

A Conference on Certification in Rutland.

Medical practitioners in Rutland met representatives of approved societies at a conference held recently at Stamford, and reported in the *National Insurance Gazette* for Jan. 30th. It was decided not to discuss memorandum 329 I.G. as a whole, but to consider a few contentious points in administrative procedure. The chairman of the conference has summarised the discussion under headings, of which we quote the following:—

RELATIVE INCAPACITY.—The case of an insured person normally engaged in heavy work—e.g., an ironstone quarryman, who is incapable of that work and in receipt of benefit, but who has entered a stage of convalescence.

Answer: It appeared that societies would welcome information from practitioners when an insured person has so far recovered as to be able to do light work, although unfit for his usual occupation, and that practitioners could convey this information to societies in these cases by using the remarks space on medical certificates.

ANY WORK TO GO TO?—Should a doctor have any regard to the point as to whether a patient has any work to go to on recovery from illness?

Answer: It was considered that the practitioner should have no regard as to whether a patient has work to go to on recovery from illness.

SUSPECTED MALINGERING.—In cases of doubtful incapacity for work or suspected malingering, would medical practitioners prefer to reply to an inquiry from the society before the society refers the case to the regional medical officer?

Answer: It appeared that the medical practitioners would be willing to reply to such an inquiry, although it was remarked that this would entail further clerical work on the practitioner, which was undesirable.

REFERENCE TO R.M.O.—Having regard to the fact that practitioners can refer cases to the regional medical officer without payment of a reference fee, whilst a society has to pay 1*s.* 6*d.* in every case, could practitioners be induced to make greater use of the regional medical officer?

Answer: Several members of the medical profession stated that they were unaware that societies were subject to the charge mentioned in respect of references made by them. References by practitioners necessitated completion of a somewhat lengthy form and again increased clerical work. Some practitioners inserted the words "Refer to R.M.O." on certificates, but some societies took no action on this remark. It was felt that further precautions should also be taken by all concerned to ensure that the patient did not become aware as to whether he was referred by the society or the practitioner.

THE SICK VISITOR.—Medical certificates are to be regarded by societies as part evidence of incapacity only, and the society is under an obligation to satisfy itself that incapacity does exist—i.e., calls by sick visitor.

Answer: It appeared that this point was raised in order to acquaint medical practitioners of this obligation placed on societies as it was considered that, in the absence of knowledge on this point, there was a danger of offence being taken by practitioners against a duty which societies are called upon to perform.

Range of Service and Emergency Treatment.

Addresses are being given this winter in London to students and recently qualified men on insurance practice by lecturers thoroughly conversant with all the ramifications of the regulations. Dr. E. A. Gregg addressed U.C.H. men, and Dr. A. F. Heald St. George's men in December, and last month Dr. R. G. Chase gave a lecture at St. Bartholomew's Hospital which was reported in the Supplement of the *British Medical Journal* for Jan. 23rd. Dealing with the range of service in insurance practice this included, he said, all proper and necessary medical services other than those requiring special skill or experience of a degree or kind which general practitioners could not, as a class—that last phrase was important—reasonably be expected to possess. Those to whom he was speaking, he remarked, were about to go out into general practice with a knowledge of the latest methods of diagnosis and treatment, but the position of the older qualified men had to be remembered, men who had been in practice for many years, and who, perhaps, were not familiar with the latest methods. The range of service implied, not that which a particular man was capable of undertaking, but the kind of service of which general practitioners as a class were capable. A necessary qualification to this, however, was emergency treatment. In an emergency the practitioner might be called on for quite exceptional services. For example, in a case of laryngeal obstruction, it was the practitioner's duty, assuming, of course, that there was no possibility of getting the patient into skilled hands in time to save his life, to do a tracheotomy, whether he had special skill or not. Dr. Chase recalled the case of a doctor—a capable surgeon—who reported on the usual form that he had operated on a case of appendicitis which was of an urgent character. But he was not allowed to charge for the operation, because, although it was one beyond the skill commonly possessed by the general practitioner, he had reported it as an emergency.

Insurance Practitioner as Social Reformer.

Dr. G. de Swietochowski regards[1] the insurance medical service as the chief agency of social reform in the near future. Doctors, he says, have the best qualifications that men can have to make successful leaders amongst social reformers. They are intimately associated with large numbers of people, the character of the relationship being naturally a friendly one and at the same time a confidential one; they have the education and standing; above all they have the confidence of millions of people whose needs they know well, and they have the power to say and do things like no other men in the country. More use, he thinks, should be made of the link which has been established between the doctors and the government through the national health insurance system in order to introduce new methods and break with the old ones. The support of the government should enable insurance practitioners to exercise a gentle

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[1] Presidential address to the Paddington Medical Society reprinted from the Medical World of Dec. 11th, 1931.

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I am, Sir, yours faithfully,
G. W. NICHOLSON.
Guy's Hospital, S.E., Feb. 7th, 1932.

To the Editor of THE LANCET.

SIR,—Mr. J. J. M. Shaw, in his first article, suggests the possibility of the lowering of the anti-epithelial resistance in pregnancy to permit the invasion of the trophoblast. At that stage there is no continuity of tissue between uterus and ovum and nothing, one may suppose, to indicate the presence of a stranger requiring such accommodation. On the other hand the trophoblast, having eroded its way into the required position, disappears. May it not be that its presence acts as a stimulus to the production of an antibody which effectively destroys the invader, the occasional failure of such a reaction permitting chorion epethelioma? The blood-serum of early pregnancy might possibly show some action on living cancer cells.

I am, Sir, yours faithfully,
P. L. W. WILLIAMS, F.R.C.S. Edin.
Padstow, Feb. 5th, 1932.

THE SPAHLINGER REMEDIES.

To the Editor of THE LANCET.

SIR,—May I be allowed to clear up some of the misapprehensions which have crept into your leading article of Feb. 6th. It is quite true that, after having sent several commissions—one of which included the late Prof. Ritchie—to investigate my work, the British Red Cross offered me a sum of £30,000 for the right to distribute my preparations in the British Isles. Under the agreement I had one year within which to decide whether I was able to supply the large number of doses stipulated for each year. I found it impossible within that time to simplify the methods of production, as I had hoped, sufficiently to supply these large quantities; and therefore I availed myself of a clause in the agreement providing for its determination upon repayment, which I duly made, of the sum received plus interest. I am very anxious that the truth about the Red Cross agreement should be known in view of the absurd stories which have been circulated on that subject. When the Ministry of Health offered me facilities for "an independent experimental trial," my supply of complete preparations was exhausted through lack of funds, and that fact is officially recorded by the Ministry.

Coming to your comments on my formula, in which you find certain "lacunæ," I should like to say that I purposely refrained from describing any technical processes or data with which bacteriologists are familiar, because I was anxious not to be accused of belittling the knowledge and technique of contemporary research workers. At the same time I took pains to describe my method fully enough to enable competent bacteriologists to reproduce my vaccines. Let me, however, reply quite briefly to the points raised by you:

1. It is not usual to find "secondary organisms" in bovine tuberculous lesions; and with moderate skill, tubercle bacilli can be isolated from human lesions without recourse to "acid or alkali to destroy any stray secondary organisms, such as is the usual practice nowadays."

2. You ask what organs or tissues I use. Personally I prefer defibrinated blood, serum, or ascitic fluid. I only mentioned organ and tissue extracts in order to explain that these could also be used as media—as I have experimentally verified—provided they supply a specific *unaltered native* bovine or human fluid to the tubercle bacillus. For methods of extraction and filtration of organs and tissues I would refer to the orthodox text-books on the subject.

3. I do not restrict the use of glycerine, glucose, peptone, or distilled water (not "saline" as you say) to the "cultivation of human strains." These substances can also be used for the cultivation of bovine strains.

4. The "method of removal of oxygen" I did not describe in detail, because there are several and those are part of the usual bacteriological routine, when dealing with anaerobic conditions, or with the preparation of stable standards, or with toxins which easily oxidise, &c. I have made emulsions in vacuo—as you suggest—and in the presence of hydrogen with equally good results.

5. As to the "method of estimating the strength of the bacterial emulsion" may I explain that the emulsion is prepared in large enough quantities to be weighed in a sterile manner. The amount of vaccinating material can therefore be determined in fractions of weight. This point concerns not the method of preparation, but the application of the vaccine—i.e., the dosage. The dosage varies according to the degree of immunity required in the vaccinated animals and the severity of the infection to which such animals are subjected.

I intend shortly to publish the records of my experiments on cattle, giving complete details as to dosage, nature of antigens used in each test, number of injections, reactions, temperatures, autopsies, &c. The comparative results of these tests throw considerable light on immunity, allergy, and resistance increased or diminished by specific means.

I am, Sir, yours faithfully,
London, Feb. 9th, 1932. H. SPAHLINGER.

BRILLIANT GREEN FOR SYCOSIS.

To the Editor of THE LANCET.

SIR,—In your annotation with this title in the issue of Jan. 23rd (p. 202) you quote Prof. Senin as having found this dye a reliable remedy for sycosis, and myself as having studied its bactericidal action in high dilutions on streptococci. The letter of Dr. R. Prosser White (Jan. 30th, p. 261), commenting on this, attributes the virtues of Prof. Senin's brilliant green solution "largely" to the alcohol which it contains, and states further that alcohol is also "the chief active agent in the antiseptic use of tincture of iodine and picric acid." I cannot imagine that Dr. Prosser White has any authority for this statement. Alcohol is a weak germicide, as might naturally be expected from the fact that it is actually produced by bacterial action. My own results, detailed in the paper to which you referred, indicate that brilliant green, iodine, and picric acid are respectively 2000, 180, and 400 times more powerful as germicides than alcohol, judged by the maximum dilutions at which they were effective under the conditions of the tests made. That the conditions of practical use will reduce their efficiency is certain, but the same conditions militate against the successful action of alcohol, with the added disadvantage that evaporation terminates its action within a few minutes.

I draw attention to Dr. Prosser White's statement because it exemplifies an attitude which seems to me to stand in the way of progress in the use of germicides. The extraordinary bactericidal properties of brilliant green have been demonstrated repeatedly in the laboratory; by Prof. Senin's pressure on their patients without the fear of losing them. He adds :—

> “ In this way we may some day be able to tackle the everlasting craving for medicines, pills, and lotions. We could perhaps even face the question of drink without the fear of a revolution. If the whole medical profession lays down its views frankly, resolves unanimously to adhere to its principles and is backed by the supreme executive of the country, no great difficulties can arise. Whereas if undertaken by single individuals all such efforts are nipped in the bud. Even the hospitals in order to remain popular have still to keep up unnecessarily large supplies of practically useless stuff.”

Looking back, he says, we must admit that things have improved a great deal, especially through schools and communal legislation ; the partial prohibition of smoking and spitting in public places, followed by the anti-litter campaign as well as the very modern anti-dog-and-pavement measures are all to the good. But why should *personal* dirt still enjoy the privilege of going about unpunished ? Surely, sooner or later this will be dealt with by a definite and separate legislation. The conditions in factories and workrooms, though vastly improved, still offer room for further amelioration. But the conditions of people's homes, their habits and customs and superstitious beliefs form a rock against which many good intentions are shattered to atoms. Here, he suggests, coöperation of government and a well-organised medical profession might introduce reforms of greater national importance even than those expected from and only partly realised by the National Health Insurance Acts.

CORRESPONDENCE

THE MECHANISM OF TUMOUR FORMATION

To the Editor of THE LANCET.

SIR,—May I express my admiration of Mr. J. J. M. Shaw's paper on the Ætiology of Cancer in recent numbers of THE LANCET ? It increases knowledge and is very opportune. Mr. Shaw argues truly, as I believe, that one “ cause ” alone will not account for tumour formation. Nor is there a logical or biological necessity that it should. The most superficial analysis of causation—as it concerns the living body—distinguishes two factors or groups of factors : the factor of realisation or the *stimulus ;* and the factor of determination or the *reaction* of the organism. The stimulus is extrinsic to the reacting part, regardless of its nature and origin. Its action is limited to inducing the reaction. The very nature and characters of the reaction are determined by the “ constitution ” of the organism, which means, in the end, its physico-chemical composition. Growth and development and, in short, all vital phenomena, are innate reactions to extrinsic stimuli. This is their mechanism, or “ cause,” in the eyes of biology.

Tumour formation is a manifestation of life when all is said and done. Like all vital phenomena it is an *innate* reaction to an extrinsic stimulus. I submit that knowledge of the latter is sound and adequate, though not complete. It is, as duly emphasised by Mr. Shaw, not one single stimulus, but one of many stimuli : from living parasites through introduced chemical substances and physical agents to products of metabolism of the body itself. Every one of these is followed by tumour formation. Their action as factors of realisation is demonstrated. What more can pathology do or be asked to do than to progress on these lines ?

Much less is known of the innate reactions, the fons et origo of tumour formation. Now tumour formation is suggestively like physiological growth and development. It is (1) reaction to extrinsic stimuli, (2) proliferation and differentiation of cells capable of these functions, (3) consequent acquisition of new characters, (4) maintenance, and (5) transmission to future cell generations of the characters thus acquired. All these are subject to control and modification by the organism—even in tumour formation much more widely than generally admitted. I would draw particular attention to Nos. 4 and 5. They represent the so-called autonomy of tumours. In its persistence long after the factor of realisation can often be shown to have ceased to act, and in its essentially “ intrinsic ” manner of growth by proliferation of its own cells alone, an established tumour differs radically from a reaction to an infection, but agrees with every somatic organ. I find it impossible —I use the word advisedly—to regard tumour formation otherwise than as a *developmental* sequence ; delayed and pathological development, if you please, but development nevertheless.

There is no necessity for the assumption of a superadded *new* reaction in tumour formation, in the sense that it is without parallel in physiological development, as Mr. Shaw is careful to indicate. Tumour formation is “ new growth ” or “ neoplasia ” simply in the sense that the liver or kidneys arise anew in the embryo. The same essential mechanism produces them all. Instead of morbid and unnatural, tumour formation is biological and natural, the expression of a physiological “ potency ” of every not fully differentiated cell. The factor of realisation alone is abnormal and pathological. Tumour formation is one of alternative innate reactions, the other of which is proliferation followed by differentiation as a physiological tissue, in wear and tear and in compensation for accidental loss, &c. It is the segregation of ever-present alternative potencies, as induced or realised by stimulation. This I regard as the *mechanism of tumour formation,* just as it is the mechanism of development and growth. The precise nature of its component reactions and their results are questions mainly for biology, and for chemistry and physics in the last resort. Many are beginning to be known.

We should bear in mind that tumour formation is the expression of a much less simple biological mechanism than the immediate reaction to an extrinsic stimulus. The generally enormous latent period of occupational cancer and of experimental tumour formation indicates this. Just as the advent of the kidneys, to take an example, is “ prepared ” by a long sequence of reactions in development, demonstrably beginning with metameric segmentation of the mesoderm if not sooner, and in the absence of any one of which there are no kidneys, so it may well be that tumour formation is the last of many successive reactions, the effect by summation of all those that have gone before.

I conclude that we know just as much of tumour formation as we can expect or be expected to know. Our knowledge is a pretty accurate measure of our ignorance of the mechanism of development and growth. Biology freely admits incompetence to very likely during an anticyclone, when the denser air with the higher barometer buoys us up more, so we walk with less exertion than on a damp cold day with a low barometer—a day we describe as "heavy," though cubic foot for cubic foot the air is lighter; it is we who are less buoyed up, it is we who are heavier; and, besides, air saturated with moisture has a higher specific heat, and so more chilling effect. What we want is more observations of the association of certain meteorological conditions with increase or decrease of illness. Another question to be answered is the period of incubation or invasion of a nosological effect. It used to be said that as a cyclone swept over the United States, so it was followed by doctors' claims for medical treatment of the pensioners whose rheumatic pains had become exacerbated as the low pressure area reached them. But that was some years ago, and I have not heard about that lately. There is much more to learn about the influence of weather on health. It is a pity more detailed observations are not made.

I am, Sir, yours faithfully,

Southborough, Jan. 30th, 1932. W. E. HOME.

CANCER OF THE LUNG.

To the Editor of THE LANCET.

SIR,—In a letter published in your issue of Jan. 30th, Dr. Ellman expresses surprise that no reference was made to a book by Dr. Maurice Davidson in an annotation on cancer of the lung published in your issue of Jan. 23rd. Are we not too apt to overlook important work which is done in this country and to place too much importance on foreign medical literature? The amount of literature is so appalling that its very size is apt to clog rather than hasten the wheels of progress.

I am reminded of a review of some medical work in which the author was criticised for failing to give reference to some foreign work of minor importance. I noticed that the author had also failed to give any reference to a recent and important English work on the same subject, but upon this fact the reviewer omitted to comment. It has been said that in England one has but to add "Offski" to one's name to get a following, and it is certainly a peculiarity of the English to belittle themselves. Only the other day I read in an evening paper complaints about the smoke or dirt in the sleeping-cars of English railways. In America they find it necessary to use wire gauze netting over the railway carriage windows, and even this fails to keep out the smuts. On the continent the trains, and even the luxury trains in which I have travelled, are no cleaner and undoubtedly far less steady than are the trains in this country, yet the average Englishman is always ready to compare his railway or other services unfavourably with other countries. If one pointed out to an American that the trains in that country started and stopped with a series of jerks like an old-fashioned luggage train he would be genuinely offended. As far as I am aware, in no other country but England do people take a delight in belittling themselves.

It would be interesting to hear what modern psychologists have to say about it. I have heard it suggested that it is a form of superiority complex; the Englishman really being completely convinced that he and his country are in every way superior to all others.—I am, Sir, yours faithfully,

L. S. T. BURRELL.

Chandos-street, Cavendish-square, W., Feb. 1st, 1932.

THE CAUSATION OF CHRONIC GASTRO-DUODENAL ULCER.

To the Editor of THE LANCET.

SIR,—I am very grateful to you for the review of my book which appeared in your issue of Jan. 30th (p. 248), and perhaps you will permit me to comment on some of the points raised by your reviewer. I agree that experimental proof in support of my theory would have clinched my argument, but is it always possible or even necessary to prove experimentally a theory before publishing it? I may add, however, that I am at present engaged in experiments which I hope to bring to a successful conclusion, and which will include the verification of G. M. Smith's work (*Journal of Medical Research*, 1914, xxx., 147) quoted at length in my book and which I consider to be of crucial importance.

Your reviewer also says that admittedly good results have been obtained by methods which are partially or wholly opposed to my theory. I think that most general practitioners and all surgeons will refute the first part of this statement. As to the second part, I have endeavoured to show that *two* factors are concerned in the production of peptic ulcers—namely, (1) bile, and (2) hydrochloric acid, and since present-day medicinal treatment consists mainly in the administration of large and frequent doses of alkali, it will be obvious that this treatment abolishes the essential acid factor; hence the temporary improvements and so-called cures which only last as long as treatment is persevered in.

Although your reviewer has not discussed the details of my theory, perhaps you will allow me to mention that before embarking on the involved problem of the mechanism of the formation of chronic peptic ulcers, I have postulated a new conception of the pathology to differentiate between the acute and chronic peptic ulcer which, in my opinion, must form the starting point in the study of this most urgent problem.

I am, Sir, yours faithfully,

J. JACQUES SPIRA.

Half Moon-street, W., Feb. 6th, 1932.

TUBAL PREGNANCY.

To the Editor of THE LANCET.

SIR,—Before you in your wisdom close this correspondence, may I say that my clinical note was as brief as possible because I merely wished to draw attention to the discoloration of the abdominal wall, and therefore did not give a detailed description of the operation.

Thanks to the courtesy of Prof. Miles H. Phillips, I now know that the sign is rare, may have no direct connexion with the presence of blood in the peritoneal cavity, and indeed may occur where there is no hæmorrhage. Prof. Phillips also very shrewdly suggests that the bruising of the abdominal wall may be due to external manipulations, and in favour of this is the rareness of bruising in tubal rupture.

I must thank Mr. Goodwin for his solicitude on my behalf because of the onslaught of Prof. Blair Bell. Under any circumstances my reverence of you, the knowledge that THE LANCET is on the desks of Editors of Standing throughout the world, and, above all, a sense of humour curb me from giving "reins and spurs to my free speech." I know Prof. Blair Bell does not believe a word I write, but he does not believe anybody very readily, and however forcibly he may express himself such a controversalist does stimulate even if he may cause a little pain.

In fairness to Prof. Blair Bell it must be pointed observations, as by others, these properties are shown to have a valuable clinical application, and yet, it seems, the significance of their clinical results may be perverted, an explanation being substituted for which there is no experimental basis. I submit that chemical methods of combating infection should be based on accurate knowledge of the capabilities of the agent used for destroying the particular micro-organism concerned; if they remain, as they largely are now, a matter of personal taste, or of conventions dating from the past, the only prospect of improvement is by the process of trial and error, one which in therapeutics may be almost indefinitely prolonged.

I am, Sir, yours faithfully,

LAWRENCE P. GARROD.

Pathological Department, St. Bartholomew's Hospital, London, E.C., Feb. 8th, 1932.

THE PREVENTION OF DEAFNESS.

To the Editor of THE LANCET.

SIR,—In your issue of Jan. 30th, Mr. Macleod Yearsley takes me to task for a sweeping condemnation of the Zünd-Burguet and similar apparatus for re-education of the deaf. In so far as the statement was not made on personal experience I stand corrected. But, in making it, I was guided not only by the general attitude on the subject, but also by the personal experience of two friends who had tried the method as patients. Both of them are highly educated people, one a most observant medical practitioner. I am only too pleased to learn that their unsatisfactory experience is not universal, and I am obliged to Mr. Yearsley for drawing my attention to his handbook on the subject.

I am glad that Mr. Yearsley should regard me as a follower of himself and Dr. Kerr Love in preaching the prevention of deafness. Their pioneer work is widely known, if not suitably recognised. All who have the welfare of the deaf and the potentially deaf at heart know the vast difference that their work has made.

I am, Sir, yours faithfully,

Harley-street, W., Feb. 8th, 1932. MAURICE SORSBY.

THE ZÜND-BURGUET METHOD IN VERTIGO.

To the Editor of THE LANCET.

SIR,—It is encouraging to those who know and appreciate M. Zünd-Burguet and his method to find that the value of the Electrophonoïd is becoming more and more recognised in this country. I would like to endorse Mr. J. A. Keen's outspoken article on its use in the Ménière syndrome. Its value in the treatment of vertigo is pointed out in my *Manual* (written in collaboration with M. Zünd-Burguet and published in 1927) and I contributed a striking case in support of this in the *Practitioner*, in 1927. It may interest your readers and Mr. Keen if I briefly condense the main facts of this observation here.

Miss A.B., 21, became deaf in the left ear following an attack of acute middle-ear catarrh two to three years earlier. For two years she had suffered with increasing vertigo and underwent several time-honoured treatments without result. At the time she consulted me the vertigo had become so severe, causing her to fall to the right, that she feared to go out. The whisper hearing was reduced in the left ear to 2 feet. Romberg's test showed unsteadiness to the right. No nystagmus. No tinnitus. Electrophonoïd treatment was begun and the vertigo ceased before 15 sittings had been completed. It has never returned. At the end of 30 sittings the hearing was 12 feet. She had a later consolidating course o 20 sittings and the hearing increased to 15 feet This highly satisfactory result has been maintaine to the present date, and for three years she has bee an enthusiastic mountaineer.

Since this case I have had three Ménière patient in all of whom the vertigo has speedily disappeare under the electrophonoïd treatment.

I am, Sir, yours faithfully,

MACLEOD YEARSLEY.

Harley-street, W., Feb. 6th, 1932.

METEOROLOGICAL FACTORS ON HEALTH.

To the Editor of THE LANCET.

SIR,—In the paper reported in your issue Jan. 30th, the Director of the Meteorological Offic Dr. Simpson, concluded that the only recognisabl influence of meteorological conditions on huma health was the stimulation produced by the coolin effect of wind. How far we have travelled since joined the profession, when the fevers and oth disorders we met abroad were commonly ascrib to climate! Against that belief I always protested it was so hopeless, discouraging all effort towards t prevention of disease. In a man-of-war one cou get observations registering the meteorological cond tions every four hours day and night. These recorded regularly, and luckily we spent most three winters in Malta harbour. At first one cou come to no conclusions, but in 1887–88 and 1888– it appeared that if at any hour of the day a relati humidity of 80 per cent. was recorded, a case of so throat came for treatment the following mornin two coincident observations, meteorological and nos logical. For years afterwards I kept logs for t Meteorological Office, who sometimes were go enough to lend me instruments, and besides ma observations at other times for myself, but nev obtained further coincidences of value. Those mention from Malta, were made in a central-batte ship, without artificial ventilation, with some 650 me Whether the humidity caused the disease, wheth it was a measure of the *stillness* of the air in t thermometer screen, and so related with the pover of ventilation in the ship below, I cannot say; the coincidence did occur, there, and I have nev since spent time in a harbour so airless, in so lar a ship.

When I came home I sought for similar reco of observations, and only found them in the "Pract of Medicine" of Dr. Aitken, then professor of medici at Netley, who quoted them from Dr. Francis Hon surgeon to Cadogan's (6th) Dragoons, at Bois-le-D in Flanders, in 1748. He thought humidity a pri cause of disease, which attacked especially troops damp situations. He had a hydrometer, catg From June 29th to July 12th, dry weather, "no m taken bad." On the 12th, "my hydrometer fell ve low," the distemper began; three men were seiz with it, and others every day in the next week whi continued damp; there were not so many in t dryer weather that followed, and so on.[1] I have personal interest in these inconclusive observatio made as they were by my great-grandfather, and have been unable to find others definitely paralleli meteorological observations with the incidence disease.

As was remarked in the discussion on Dr. Simpso paper, often empiricism comes by its own in the lo run. We all feel the benefit of a bright dry da methods. Patience, unfailing kindliness, the faculty of always realising and understanding another man's point of view, combined with practical demonstration and help, quickly convinced an ever-increasing number of dairy farmers round Reading that the application of science was not a fantastic folly, but a saving of hard cash as their milk kept longer. From these beginnings he followed the milk through its various stages to the time it was delivered to the consumer. The retailers were quickly convinced that scientific methods were a practical and money-saving proposition.

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[1] Home, F.: Medical Facts and Experiments, London, 17 pp. 61 and 62.

"The ideal Williams aimed at was to free, in time, the country of bovine tuberculosis, so that fresh milk could be safely drunk. There was no doubt in his mind that there are properties in raw milk that are destroyed by heating, and he bewailed the fact that practical research on these properties has been so neglected. His loyalty and devotion to his staff was only equalled by theirs to him. He refused absolutely to take any credit to himself for work done by others, and insisted on each one having his share, including the laboratory assistants. On the other hand, not a particle of work was allowed to be published that could not stand up to any criticism directed against it. He had a great sense of humour and a charming twinkle in his eye which endeared him to his friends, children, and animals. If anyone was in trouble of any kind he would never spare himself or his pocket to do what he could to help. His health, never robust, was seriously affected by a gastric operation some years ago, and by constant lecturing all over the British Isles he overdid his strength. Latterly he had been terribly worried by the reduction in the salaries of his staff and the constant strain of obtaining enough money to carry on the Institute."

It remains to put on record Dr. Williams's love of nature in all its moods which led him to find his chief recreation in climbing, and no doubt influenced him in giving up an academic career in Liverpool for one more in contact with animals and growing things.

While in Liverpool he married Helena Margaret, daughter of Thomas Crosfield, and he leaves two sons and a daughter.

THE LATE COLONEL S. F. LOUGHEED, R.A.M.C.

Major-General Edgar M. Pilcher writes: Will you allow me space for a few grateful and appreciative words to the memory of Colonel S. F. Lougheed, of the Royal Army Medical Corps, whose death was announced last week? Lougheed was prevented by chronic and persistent ill-health from rising to the top of his service, but he was one of those whose spirit triumphs over the frail body, and to a small band of workers, of whom I am proud to have been one, he was a perpetual inspiration. Invalided from India in 1894, he wasted no time in self pity or futile search for amusement, but set himself to a course of post-graduate study at the West London Hospital, and found the work most suited to his taste in the surgical clinic of the late Mr. Leonard Bidwell. Lougheed had beautiful hands and a real flair for surgery, and when his appointment to the Royal Arsenal at Woolwich gave him opportunity to practise he showed that he could not only operate but teach. Those of us who came within the range of his influence will bear me out when I say that surgery in the Army, gradually arising from a very dark age, took much of its inspiration from the enthusiasm and personal example of Samuel Lougheed.

PARLIAMENT

NOTES ON CURRENT TOPICS.

GOVERNMENT'S TARIFF POLICY.

On Thursday, Feb. 4th, the House of Commons went into Committee of Ways and Means (Sir D. HERBERT, Chairman of Committees, in the chair) on the first of a series of resolutions connected with the Government's Trade Bill.

Mr. NEVILLE CHAMBERLAIN, Chancellor of the Exchequer, in moving the resolution, said that, so far, the Government had averted disaster to the country; now they were beginning constructive work. They had succeeded at least in improving the situation since last November. The emergency Budget might have been thought unrealisable, but, while he could not guarantee final results at that stage, the collection of income-tax was 50 per cent. higher than last year, and, if companies followed the magnificent lead of individual taxpayers, the yield would more than compensate for losses on other taxes. The cost of living had been unaffected by the fall in the external value of the pound sterling, and was actually six points lower than on Jan. 1st, 1931. Sterling, too, had shown gratifying stability. There had also been a definite improvement in trade in certain directions.

There was no use, however, in pretending that the country had turned the corner. Apart from other important considerations, the trade balance was still adverse. Taxpayers could not be heroes indefinitely; taxation could not remain indefinitely at a crippling level. A credit balance of trade of £100,000,000 in 1929 had become an adverse balance of £113,000,000 in 1931. The problem was to increase exports and to diminish imports. A policy must be chosen which offered the greatest balance of advantages over disadvantages. The scheme chosen had seven objects: (1) the correction of the balance of trade; (2) the raising of revenue without imposing undue burdens on any section of the community; (3) moderate and scientific protection to transfer production to our own fields and factories; (4) encouragement of industrial efficiency; (5) promotion of tariff agreements with foreign countries; (6) retaliation against foreign tariff discrimination; (7) advancement of Imperial economic partnership. The basis of the scheme was a general tariff of 10 per cent. modified by a short free list, which included wheat, meat, fresh fish of British taking, raw cotton and wool, and tea. The 10 per cent. would not be added to existing duties and existing Acts imposing them would continue until replaced by something else. Neither the new general, nor the new specific duties, would apply to goods from the Dominions, at least pending the results of the Ottawa Conference. All produce from colonies, protectorates, or mandated territories would also be exempt. If any foreign countries discriminated against British goods the Board of Trade would have power to impose duties up to 100 per cent. on their goods. After the Ottawa Conference there would also be power to offer reciprocal lowering of tariff barriers to foreign countries.

After considerable discussion the debate on the first resolution was adjourned.

HOUSE OF COMMONS.

WEDNESDAY, FEB. 3RD.

Street Accidents.

Mr. BUCHAN-HEPBURN asked the Home Secretary whether he could give any information, in advance of the annual return which was presented to Parliament, of the number of street accidents caused by vehicles and horses in 1931, which resulted in personal injury and came to the notice of the police.—Sir H. SAMUEL replied: The following are preliminary figures as to street accidents caused by vehicles and horses during 1931, which resulted in personal injury, out that Cullen preserved the tube in his patient with a tubal pregnancy. In my patient there was active bleeding, the tube was ruptured, and the peritoneal cavity was sufficiently full of blood to cause abdominal distension and moveable dullness in both flanks.—I am, Sir, yours faithfully,

W. E. TANNER.

Queen Anne-street, W., Feb. 6th, 1932.

To the Editor of THE LANCET.

SIR,—I should like first to express my regret that Prof. Blair Bell should have misconstrued the meaning of the opening paragraph of my letter. No one reads his articles with greater interest than I; there is a refreshing originality about them, and they open new avenues of thought as well as giving many useful suggestions about treatment, though they necessarily must be controversial at times. It is to this very originality that I was trying to pay compliment.

I think he is a little hard on Mr. Tanner, when one considers that he did not see the specimen or the condition of the abdomen when it was opened. Surely, if Mr. Tanner says that the abdomen was filled with blood, it must have been. This is not an uncommon sight in London, but perhaps our women bleed more freely than they do elsewhere. I think he must be congratulated on having adopted the quickest surgical procedure consistent with safety in this case.

My "elementary" questions were asked in the hope that I might learn something which might help me in the future, but the answers to them, and the bibliography referred to in the text of Prof. Blair Bell's letter, leave me what I was when I first wrote—an unregenerate gynæcologist.

I am, Sir, yours faithfully,

AUBREY GOODWIN.

Queen Anne-street, W., Feb. 6th, 1932.

To the Editor of THE LANCET.

SIR,—In your issue of Jan. 16th, Mr. W. E. Tanner reported a case of ruptured tubal gestation with bruising in the umbilicus and on the abdominal wall, and remarked that he could not find a record of any similar case. The bruising and discoloration of the umbilicus and skin of the anterior abdominal wall was described by Cullen several years ago, and is known in this country as "Cullen's sign." Any free bleeding in the peritoneal cavity may give rise to this sign, hence it is not pathognomonic of ruptured tubal pregnancy. I, personally, have only seen it once in a large number of cases of ruptured ectopic gestation.—I am, Sir, yours faithfully,

A. J. GORDON, M.D., F.A.C.S.,
Associate Attending Gynæcologist, Newark City Hospital.

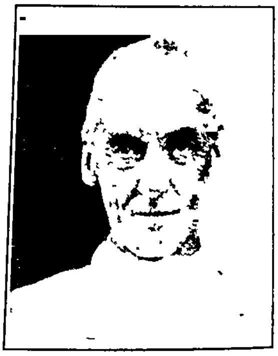
Feb. 2nd, 1932.

COST OF MOTOR ACCIDENTS TO HOSPITALS.—Last year 50 road accidents were admitted to the Horton General Hospital, Banbury, as compared with 26 in 1930. Of these accidents 27 were to riders of motor-cycles. It was stated at the annual meeting that two cases cost over £300. The East Suffolk and Ipswich Hospital last year admitted 109 motor-accident patients, who stayed for an aggregate of 3155 days. The average stay of an in-patient in this institution is slightly under 19 days, but these averaged 30 days. They cost £1419, and £136 was recovered from the insurance companies; the patients gave £92. Analysis of the cases shows that 12 were motor-car drivers and passengers, 36 motor-cyclists and pillion-riders, and 61 pedestrians. It is pointed out that the Road Traffic Act makes no provision for subsequent treatment in the out-patient and special departments, nor for the cost of transport, which at Ipswich exceeded £38.

OBITUARY

ROBERT STENHOUSE WILLIAMS,
M.B., B.Sc. Edin., D.P.H. Camb.

Dr. Stenhouse Williams, Director of the National Institute for Research in Dairying at Reading, died on Feb. 2nd in University College Hospital, London, where he was taken unconscious after an apoplectic seizure on the Irish mail train. He was in his sixty-first year and, although obviously frail, was carrying on his work at full pressure until the previous day. His death removes a remarkable personality, and one which achieved much by devotion to a cause—namely, the production of clean milk.



DR. STENHOUSE WILLIAMS.

Dr. Williams was born and brought up in Liverpool, commencing his medical study there and completing it in Edinburgh, where he qualified in 1896 and took the higher degrees in 1902. He then returned to Liverpool as assistant superintendent of the Institute of Comparative Pathology, later becoming bacteriologist to the David Lewis Northern Hospital, and lecturer on public health bacteriology in the University. For some years he was assistant physician to the Stanley Hospital and to the Hospital for Consumption, and at various times he held a number of teaching appointments and contributed freely to the literature of experimental and clinical pathology. In 1912 he was called to Shinfield, near Reading, to direct the research institute founded by the Ministry of Agriculture and Fisheries, and governed by a board representing the Ministries of Health and Agriculture, as well as the organised farming and dairying associations. For 20 years he directed this Institute with its five departments of bacteriology, chemistry, husbandry, physiology, and dairying, with the aid of a band of workers who were in course of time drawn into the University of Reading, Dr. Williams himself being given the chair of research in dairy bacteriology. An account of his work may be given in the words of one of his close associates, Dr. E. C. G. Maddock, honorary research fellow. Dr. Maddock writes:—

"Stenhouse Williams may be called the founder of the Clean Milk Movement in this country. From the very beginning he realised that the Ministries of Health and Agriculture must work together to this end, and he was always loyally helped by members of the veterinary profession, who responded to his enthusiasm. With his natural thoroughness he decided that for milk to be delivered clean the process must begin with the cow and the milker, and be on such a practical basis that it could be followed by the ordinary dairy farmer. At Shinfield he began work in the old farm cowshed, and by expending only five pounds on concrete floors, efficient lighting, drainage, and ventilation, demonstrated that clean milk could be produced through the hottest weather as long as the cows and milkers were clean and the vessels used were sterilised. Critics said it was impossible to get the dairy farmers to follow his

Cancer among Welsh Nickel Workers.

Mr. DAVID GRENFELL asked the Home Secretary whether he had received notification of the deaths from cancer among men employed at the Mond Nickel works at Clydach, near Swansea, and the number of deaths from this cause during the last three years among men who had been employed at these works prior to their disablement.—Sir H. SAMUEL replied: Notification under the Factory Act is required only in the case of cancerous ulceration of the skin due to tar, pitch, or certain other substances. No cases of this form of cancer have been notified from the works in question, and I am informed that, so far as the Factory Department is aware, there is no process carried on at the works which would expose the workers to this risk. At the request of the Department the Medical Officer of the Company has gone through their records, and finds that during the last three years six men who had been employed at the works died from cancer, but there does not appear to be any ground in any of these cases for connecting the disease with the employment. The average number of men employed during the three years was 1105. The average age of death in the six cases was 53.

Mr. GRENFELL asked if the figures given were not indicative of a very high rate of cancerous deaths, especially in view of the form of cancer which attacked all these people, which was the same kind in each case.

Sir H. SAMUEL: No. I am informed that the number of deaths is not disproportionate to that in the population generally, nor do any particular cases show symptoms of the particular kind of cancer which is due to industrial disease.

Mr. GRENFELL asked the right hon. gentleman to keep a watchful eye on the subject, and to keep as accurate a record as possible of the number of cancerous cases at these works.

Sir H. SAMUEL said that very full and careful inquiries had been made. If Mr. Grenfell would give him information which would show that these cases—six in the last three years out of 1100 workmen—were due in any degree to their employment he would be most happy to look into the matter.

Continental Vegetables and Foot-and-mouth Disease.

Major CARVER asked the Minister of Agriculture if his department had investigated the possibility of foot-and-mouth disease in this country being due to the importation of Continental vegetables; and, if so, what was the result of such investigation.—Sir J. GILMOUR replied: Inquiries are made into the source of infection in every outbreak of foot-and-mouth disease. While it is of course possible that the disease may be introduced by imports of vegetables, or of other commodities, *in no case has it been established that* infection was definitely attributable to the importation of Continental vegetables, and no evidence has yet been forthcoming which would justify the prohibition of such imports on these grounds.

Lieut.-Colonel FREMANTLE asked whether this subject had been referred to the newly constituted Agricultural Research Committee.

Sir J. GILMOUR said that very definite inquiries were always going on into foot-and-mouth disease.

Milk for School-children.

Mr. MCENTEE asked the President of the Board of Education how many local education authorities were providing milk for school-children, excluding National Milk Publicity Council schemes; and the number of children supplied with milk through the National Milk Publicity Council schemes at the latest convenient date.—Mr. RAMSBOTHAM, Parliamentary Secretary to the Board of Education, replied: During the week ending Jan. 23rd last, 81 local education authorities in England and Wales were providing milk for school-children under Sections 82 and 85 of the Education Act, 1921. My right hon. friend understands from the National Milk Publicity Council that about 800,000 children are receiving milk under their schemes.

Local Authorities and Slum Clearance.

Dr. SALTER asked the Minister of Health the number of local authorities in England and Wales who had submitted clearance orders for confirmation under the Housing Act, 1930; the number of such clearance orders that had been actually confirmed by him at this date; and the number of houses and other buildings which would be demolished as a consequence of such clearance orders.—Mr. E. BROWN replied: Up to Jan. 31st last 51 local authorities in England and Wales had submitted clearance orders under the Housing Act, 1930, for areas containing 3681 houses, and 44 clearance orders had been confirmed.

MEDICAL NEWS

Royal Colleges of Physicians of London and Surgeons of England.

At the Final Examination of the Conjoint Board held from Jan. 11th to Feb. 3rd the following candidates were approved in the subjects indicated, but are not yet eligible for diplomas:—

Medicine.—A. L. Abeyewardene, L.M.S. Ceylon, Univ. Coll.; P. Baron, M.B. Cape Town; G. P. Barua, M.B. Calcutta, London; C. G. Batty-Smith, Camb. and St. George's; S. J. Bellgard, L.M.S.S.A. Lond., St. Mary's; F. C. Bourgault du Coudray, London; M. J. Brookes, London; J. D. Burrows, St. Thomas's; T. Chadderton, Manchester; N. C. Coombs, Camb. and Bristol; D. R. Crabb, St. Bart.'s; J. M. Cribb, Cardiff; W. H. D. Davies, St. Bart.'s; Mary T. Day, Charing Cross; H. De, St. George's; L. Dexter, St. Bart.'s; G. E. Dunkerley, Univ. Coll.; W. G. Evans, Camb. and St. Mary's; K. Fawssett, St. Thomas's; Catherine F. Forrest, Royal Free; A. E. Francis, St. Bart.'s; R. G. Gilbert, St. Bart.'s; J. A. S. Goonawardena, L.M.S. Ceylon, Univ. Coll.; R. J. C. Hamilton, St. George's; O. C. Hamilton-Jones, Liverpool; G. R. Hargreaves, *Univ. Coll.*; F. R. Hayward, Guy's; J. S. Horsley, London; A. D. Iliff, St. Bart.'s; D. H. Irish, Guy's; L. S. Jaikaran, London; R. James, St. Mary's; T. B. Jones, Westminster; Agnes V. Kelynack, Royal Free; R. Kempthorne, Oxf. and Univ. Coll.; R. Knox, Oxf. and St. Bart.'s; R. A. Manclark, Middlesex; J. de C. Muller, St. *Thomas's*; W. Mushin, London; K. H. Nassif, Royal Free; H. E. Offord, St. George's; G. B. Palmer, L.D.S. Eng., Guy's; O. R. L. L. Plunkett, St. George's; S. Rameshwer, M.B. Lucknow; A. Rashid, West London; H. M. Rashid, Birmingham; S. R. H. Razwi, London; L. J. Richmond, M.B. Leeds; D. F. Robb, St. Thomas's; G. C. Sawyer, Guy's; B. H. Sayed, M.B. Punjab, St. George's; E. F. Scowen, St. Bart.'s; E. J. Somerset, King's Coll.; Charlotte M. H. Sparrow, Royal Free; J. W. C. Symonds, St. Bart.'s; J. R. Thornton, St. Thomas's; J. B. L. Tombleson, St. Thomas's; C. M. Vaillant, Oxf. and Liverpool; E. J. Walsham, St. Thomas's; E. W. Wilkins, Birmingham; V. F. F. Winslow, St. Bart.'s; S. W. Wright, Guy's; and M. Zinober, Cape Town.

Surgery.—S. D. Ahuja, M.B. Punjab, Charing Cross; J. C. G. Anderton, Camb. and Westminster; S. T. Anning, Camb. and Leeds; H. J. B. Atkins, B.A. Oxf. and Guy's; C. G. Barnes, St. Mary's; J. R. Blackburne, St. Bart.'s; R. W. W. Bose, Camb. and London; H. W. L. Broadbent, Camb. and St. Mary's; G. H. Brookman, St. Bart.'s; J. Cann, Camb. and St. Thomas's; D. B. Cater, Camb. and Charing Cross; I. A. Cathie, Guy's; A. H. Chenard de la Giraudais, Charing Cross; S. J. Chesser, Camb. and St. Thomas's; N. G. Chitnis, Bombay and Dublin; C. A. Clarke, Camb. and Guy's; Gwendolen N. Cook, Royal Free; P. T. Cooper, Camb. and St. George's; F. N. Corfe, L.D.S. Eng., Guy's; A. G. Cowie, St. Mary's; G. W. Crimmin, Camb. and St. Thomas's; P. N. Cutner, M.B. Edin.; J. E. Davenport, Camb. and London; A. M. Davies, Bristol; J. Davies, London; E. A. Devenish, Univ. Coll.; L. W. B. Dobbin, Camb. and London; G. M. Evans, Bristol; Q. F. Evans, St. Thomas's; W. B. Evans, Camb. and St. Bart.'s; J. H. Fisher, Camb. and London; J. F. P. Forster, Birmingham; M. Fröhlich, Middlesex; W. H. Gabb, Camb. and St. Bart.'s; G. D. Galwankar, Bombay; G. H. Gibbens, St. Thomas's; K. J. Gilchrist, Guy's; W. G. Gill, Camb. and Guy's; A. J. Grace, Guy's; L. Greenfield, London; C. S. Hall-Smith, Camb. and St. Bart.'s; J. Halperin, St. Bart.'s; J. C. Hardy, Univ. Coll.; E. R. Hargreaves, Camb. and St. Mary's; C. L. Hay-Shunker, St. Bart.'s; R. A. P. Hogbin, Guy's; M. D. C. Hosford, St. Bart.'s; Ursula Y. im Thurn, Univ. Coll.; C. G. Jones, Middlesex; T. B. Jones, Camb. and St. Thomas's; W. W. Jones, Guy's; R. Kempthorne, Oxf. and Univ. Coll.; W. Kravchick, St. Bart.'s; C. B. Lanyon, Univ. Coll.; A. R. R. Le Fleming, Camb. and St. Thomas's; A. W. D. Leishman, Oxf. and St. Bart.'s; A. A. Lewis, Guy's; P. Lewis, Leeds; J. L. Lovibond, Camb. and Middlesex; D. C. McClure, London; D. B. McGavin, M.B. Camb., St. Bart.'s; M. B. McGinn, London; Mary A. McKean, Royal Free; S. O. Massey, Middlesex; F. S. A. Maw, Camb. and King's Coll.; A. R. R. Mears, Camb. and St. Bart.'s; R. V. F. Mercer, Camb. and St. Bart.'s; J. A. W. Miller, Guy's; T. D. F. Money, Camb. and St. Thomas's; W. H. W. Morris, St. Thomas's; Alice M. Naish, Camb. and Royal Free; W. T. North, Guy's; J. A. Nunn, Oxf. and St. Bart.'s; J. Parkes, Camb. and St. Thomas's; R. V. Payne, Camb. and Guy's; R. E. J. Pembrey, St. Thomas's; S. H. B. Platts, Camb. and Leeds; C. B. R. Pollock, Guy's; V. T. Powell, Cardiff; J. C. Read, L.D.S. Eng., Guy's; R. G. Reid, Guy's; J. P. Reidy, Camb. and London; L. O. Roberts, St. Bart.'s; M. L. Rosenheim, Camb. and Univ. Coll.; A. Rothwell, Camb. and King's Coll.; M. H. P. Sayers, St. Thomas's; B. Shanovitch, London; I. Singh, M.B. Punjab, London; F. J. Sladen, Middlesex; S. B. Smith, Guy's; J. R. Strong, St. Bart.'s; Annie C. Taylor, Camb. and Univ. Coll.; E. H. Thierry, Univ. Coll.; C. W. Thomas, Camb. and St. Thomas's; A. S. Thorley, Univ. Coll.; H. A. Treble, Oxf. and Guy's; J. T. Turner, Camb. and St. Thomas's; J. M. Vaizey, Camb. and London; O. J. Vaughan-Jackson, Oxf. and London; A. R. Walters, Middlesex; C. B. M. Warren, Camb. and St. Bart.'s; Phyllis E. Watson, Camb. and Charing Cross; G. D. Wedd, Camb. and St. Bart.'s; H. D. White, Camb. and St. Bart.'s; H. M. Williams, St. Bart.'s; A. L. Winner, Univ. Coll.; T. G. R. Woods, St. Bart.'s; H. W. Wykes, Middlesex; and M. Zinober, Cape Town.

Midwifery.—A. L. Abeyewardene, L.M.S. Ceylon, Univ. Coll.; E. H. Allen, St. George's; S. T. Anning, Camb. and Leeds; K. S. Ayyar, M.B. Madras, Middlesex; C. G. Baker, and came to the notice of the police:—The total number of such accidents recorded in Great Britain was 181,486, of which 6495 resulted in fatal injuries to one or more persons. The corresponding figures in 1930 were 156,793 and 7074 respectively. The number of persons killed in 1931 was 6685 and 202,147 injured, as against 7305 and 177,895 respectively in 1930. There was thus in 1931 a considerable increase in the total number of accidents resulting in personal injury which were recorded by the police, but a decrease in the number of fatal accidents as compared with 1930. The figures for England and Wales show similar changes, the total number of accidents resulting in personal injury being 165,521 (an increase of 23,127), and fatal accidents 5851 (a decrease of 466). The total number of persons killed or injured in England or Wales was in 1931 190,831 (an increase of 22,329), and the number killed 6026 (a decrease of 496). These changes in the number of persons killed and injured respectively suggest that the increase in the total number of accidents resulting in personal injury may be more apparent than real, and attributable to the police obtaining fuller information regarding the accidents which occur by reason of the institution of the motor patrols and the new requirements of the road traffic Act as to the reporting of accidents. The figures from many police districts support this view, but it is to be noted on the other hand that those for the metropolitan police district show a decrease in the total number of persons injured, as well as a decrease in the number killed, the totals for 1931 being 1324 killed and 54,422 injured (not fatally), as against 1398 and 55,827 respectively in 1930. On the other hand, in some police districts, including, for instance, parts of Kent and the West Riding of Yorkshire policed by the county police, there was an increase in 1931 in the number of persons killed as well as in the number of persons injured. Amongst the cities and boroughs in England and Wales, Birmingham had the highest total of killed or injured during 1931—namely, 5688, an increase of nearly 800 over the previous year. This figure, however, is exceeded by Glasgow, where the number of persons killed or injured was 5904, which is, however, nearly 300 less than in 1930. The Liverpool figures show an increase in persons killed or injured from 4447 to 4648, and those for Manchester an increase from 3571 to 3848. Wales, as a whole, had a total of 232 killed and 7422 injured, as compared with 270 killed and 5816 injured during 1930. In Scotland the corresponding totals show a decrease of 124 killed and an increase of 1427 injured, the totals for 1931 being 659 and 17,342 respectively.

Rates of Relief.

Mr. Albery asked the Minister of Health what steps had been taken to prevent differentiation in the rates of relief paid in areas where similar conditions prevail.—Sir E. Hilton Young replied: The amount of relief to be afforded is for the decision of the public assistance authority in the light of the ascertained needs of the individual case. I have no power either to require uniformity or to define what, for the purpose of assessing relief, are similar conditions. As regards the area to which my hon. friend called my attention in an earlier question, I am informed that the local authority have taken action to remove the difficulty to which he referred.

Maternal Mortality.

Mr. McEntee asked the Minister of Health when the publication of the report of the departmental committee on maternal mortality might be expected.—Sir E. Hilton Young replied: The interim report of this committee was published 18 months ago. I have not yet received any further report, but I understand that the committee hope to present their final report very shortly.

Rural Housing.

Mr. Hurd asked the Minister of Health the number of rural district councils in England and Wales who made applications for special Exchequer assistance under the provisions of the Housing (Rural Authorities) Act, 1931; the total number of houses included in their proposals; and the number of houses which the Central Advisory Committee had recommended for erection under this Act.—Sir E. Hilton Young replied: Applications have been received from 145 rural district councils of which six were subsequently withdrawn. The remaining 139 applications were in respect of 6735 houses. The committee are not yet in a position to make actual recommendations. They have informed 97 authorities that they are prepared to entertain applications to the extent of 1591 houses for the agricultural population.

Pensions for Nurses.

Dr. O'Donovan asked the Minister of Health if he was able to give the details of existing arrangements for the interchangeability of pension schemes for nurses, sisters, and matrons in municipal hospitals; and if he would be prepared to coördinate the nurses' pension schemes in federated voluntary hospitals and in municipal hospitals.—Sir E. Hilton Young replied: I would refer my hon. friend to the provisions of the Local Government and Othe Officers' Superannuation Act, 1922, and particularly t Section 8 and 16 of that Act. I am, as my predecessor have been, willing to consider any practicable proposal o the lines mentioned in the second part of the question, bu no such scheme has as yet been submitted.

MONDAY, FEB. 8TH.

London Tube Workers and Asbestosis.

Dr. O'Donovan asked the Home Secretary if he wa advised that the precautions taken to prevent fatal lun disease in workers lining London tubes with asbestos wer adequate.—Sir Herbert Samuel replied: I have n powers of control in respect of this work under the Factor or other Acts, and have no information at present as to th precautions taken. I will make inquiries, however.

G.M.C. and Indian Medical Degrees.

Mr. Thomas Griffiths asked the Secretary of State f India what was the present position in regard to the reco nition by the British Medical Council of degrees granted b the faculties of medicine in Indian universities; and wh stage had been reached in the setting up in India of a Indian Medical Council.—Sir S. Hoare replied: T conditional recognition accorded by the General Medic Council to the medical degrees of certain Indian universiti was withdrawn in March, 1930. A revised draft Bill for t establishment of an All India Medical Council has be prepared, and it is hoped to introduce it in the Indi Legislative Assembly at an early date.

Importation of Boneless Meat.

Lord Scone asked the Minister of Health if he wou consider the advisability of prohibiting the importati of boneless meat, in view of the difficulty of detecti unsoundness or disease in such meat.—Mr. Ernest Bro (Parliamentary Secretary to the Ministry of Health) replie The importation of boneless meat which affords insufficie means of identification with definite parts of a carcass prohibited under the Imported Food Regulations of 19 My right hon. friend is now considering the amendment these regulations so as to require a recognised offic certificate of the country of origin with all imports of fre meat less than the whole carcass.

TUESDAY, FEB. 9TH.

Boys Working Underground at Night.

Mr. Tinker asked the Secretary for Mines if he had c sidered the request from the Miners' Federation of Gr Britain to meet them to discuss the position of boys un the age of 16 years working underground on night shi and if he was prepared to meet them.—Mr. Isaac F replied: The answer to both parts of the question is in affirmative.

Safety in Mines.

Mr. Tinker asked the Secretary for Mines how ma safety-in-mines conferences had been held; was it his int tion to have the proceedings and subjects that were cussed published and available to mine workers; and it was his intention to hold similar conferences.—Mr. Isa Foot replied: The sixth district Safety Conference was h at Nottingham last Saturday, and was attended by so 4000 persons representative of all interests in the min industry. I intend to hold another conference at Swan in March, and the eighth and final conference probably Birmingham in April. Every mining area in the coun will then have been covered. The proceedings at th conferences are well reported in the local press; and material is used in the various safety publications of department, and in the lectures and demonstrations o smaller scale by which the work of these large conferen is being followed up.

Sunday Repairs to Telephones.

Mr. Hutchison asked the Postmaster-General wheth in view of the fact that no telephone repairs were car out between 1 P.M. on Saturday and Monday morni except in the case of those telephones belonging to doct this privilege could be extended to the general pub seeing that no money was refunded in respect of the per in which their telephones were out of working order Mr. White, Assistant Postmaster-General, replied: T present arrangements for fault repair during week-e apply not only to the circuits of doctors, but also to alarm, police, hospital, and other circuits where the imm diate restoration of communication is in the general pub interest. My right hon. friend is considering whether is possible to extend their scope.

Hunterian Society.

The Hunterian Oration will be delivered by Dr. J. B. Christopherson at the Apothecaries' Hall, Water-lane, London, E.C., at 9 P.M. on Thursday, Feb. 25th. His subject will be the Ætiology of Chronic Bronchitis.

Royal Statistical Society.

Prof. Major Greenwood, F.R.S., will give an address to this society at 5.15 P.M. on Tuesday, Feb. 16th, in the hall of the Royal Society of Arts, John-street, Adelphi, London, W.C. His subject is the Quantity and Quality of Official Statistical Publications.

The Marie Curie Hospital.

The first endowed bed at this hospital was dedicated last week by the Bishop of Exeter, representing the women of Devon who have subscribed £2000 for the purpose. The first occupant came from Plymouth, the bed being intended for the free treatment of Devonshire women.

Subscription Benefits at King's College Hospital.

At a dinner in aid of this hospital last week Lord Gorell explained a scheme for attracting new subscribers. A subscription of £1 by a single person, £1 10*s*. by a married couple, and £2 by married persons with children will give the right during the year to three weeks' in-patient maintenance and treatment.

London School of Hygiene and Tropical Medicine

The Langley prize, which is usually awarded every three years for the best paper submitted by officers of the West African Medical Service—whether on the active or retired list—has been awarded by the School in equal shares to Dr. E. C. Smith, for his paper, A Dermatological Atlas of Nigeria, and Dr. Hope Gill, for his paper on Diagnostic Methods in Human Trypanosomiasis.

University of Durham College of Medicine.

The second of a series of lectures on Recent Advances in Physiology applicable to Medicine will be given at this College, Newcastle-upon-Tyne, at 4.45 P.M., on Friday, Feb. 19th. The lecturer will be Dr. J. J. R. Macleod, F.R.S., regius professor of physiology in the University of Aberdeen, and the subject Diabetes as a Physiological Problem. Medical practitioners are invited to attend.

Tuberculosis Association.

At a meeting of this association, to be held at Oxford from March 17th to 19th, the principal subjects of discussion will be Chronic Pulmonary Suppuration and its Treatment by Bronchoscopy and Drainage (Dr. A. S. Scott Pinchin and Dr. H. V. Morlock), Selective Lung Collapse in Bilateral Disease (Dr. F. Gravesen), and the Ætiology and Treatment of Spontaneous Pneumothorax (Dr. L. S. T. Burrell). The hon. secretary of the association is Dr. G. T. Hebert, of St. Thomas's Hospital, London, S.E. 1.

Royal Medical Benevolent Fund.

At the meeting held in January the committee voted 78 grants amounting to £1844. The following are particulars of a few cases helped:—

M.R.C.S., aged 62. One daughter aged 9. Applicant had to retire in 1929. He is suffering from chronic nephritis. He has had a number of cerebral attacks, culminating in a hæmorrhage which has caused paralysis. He can barely walk, and he is mentally incapable of any work. By the time he retired the practice had deteriorated and was unsaleable. The applicant and his wife are living on a pension of £87 10*s*. a year. The daughter's school fees have been arranged for. Fund voted £40 in four instalments, and other societies are being approached to coöperate with this case.

Widow, aged 53, of L.R.C.P. Husband died in 1927. The applicant suffers from cardiac condition and gall-stones, and is totally unfit for any employment. Her eldest daughter, aged 30, is paralysed and mentally affected, so that she requires constant care and attention. The youngest daughter is delicate. The son, aged 22, is a junior clerk. His salary is £80 a year, and he contributes £24 to assist his mother. The applicant's income is £90 a year. Fund voted £26, in four instalments, and will seek the help of other charities for this unfortunate family.

Widow, aged 67, of M.D. The applicant's husband was in receipt of an annuity of £40 from this Fund, and a Government pension which ceased at his death in 1932. The widow is left penniless. It is hoped that some reduced pension may be obtained from the Government for the widow. Fund voted £26 in four instalments.

Widow, aged 55, of L.S.A. Husband died after a few days' illness in November, 1931, at the age of 63. When the practice and house are disposed of, it is expected that there will be nothing left from the estate, for there is a mortgage to be paid off and debts to settle. There is a daughter, aged 14½. The only son, aged 30, a married man, is surgeon in one of H.M. Services stationed abroad, with a salary of £400 a year, and is at present allowing his mother £10 a month. Fund voted £26. The Ladies' Guild of the Royal Medical Benevolent Fund will assist in the education of the daughter.

Cheques should be made payable to the hon. treasurer of the Fund, 11, Chandos-street, Cavendish-square, London, W. 1.

Inquiry into Mental Deficiency.

The Minister of Health received a deputation on Feb. 9th from the County Councils Association, the Association of Municipal Corporations, and the Mental Hospitals Association on the subject of the sterilisation of mental deficients. They represented that while the associations for which they spoke had reached no final conclusion upon the desirability of sterilising mental deficients, they considered that the time had come at which a full inquiry should be made into the whole question. The Minister said that he agreed that there was a need for inquiry, and he proposed, as a first step, to arrange for inquiry to be made by competent persons into its scientific aspects.

Dentistry and National Health.

The Brighton and Hove Provident Dental Hospital has just removed to new quarters at 7, Buckingham-road, Brighton, and was formally opened on Feb. 5th by Sir Norman Bennett. After pointing out that the bearing which the teeth had on the general health had been increasingly appreciated of late years, Sir Norman said that what was wanted particularly now was some sort of service for adolescents between school-leaving age and the age at which they qualified for insurance benefits; for when children left school they got out of the habit of having their teeth regularly inspected. The present system of national dentistry might be summarised broadly as a fairly efficient, but lamentably weak, school service, a period of almost compulsory neglect, a further period of voluntary neglect, concluding with a short, intensive, and drastic course of treatment in middle or advanced age. Sir Norman expressed his sympathy with the hospital because it gave dental treatment to those who could not pay for it, or could only pay a little, and was prepared to give a similar service to wage-earners, with incomes below a certain limit, in return for weekly payments throughout the year under the Sussex Provident Scheme.

Appointments

BAND, D., M.B., Ch.B. Edin., F.R.C.S. Edin., has been appointed Assistant General Surgeon, Hospital for Diseases of Women, Edinburgh.

POOLER, H. E., M.B., Ch.B. St. And., Hon. Anæsthetist, Chesterfield Royal Hospital.

TAYLOR, DOROTHY M., M.B., Ch.B. Edin., Maternity and Child Welfare Officer, Sunderland Council.

THOMAS, OLIVER F., L.R.C.P. Lond., M.R.C.S., D.P.H., Tuberculosis Officer, Sunderland Council.

Births, Marriages, and Deaths

BIRTHS.

BEATSON.—On Feb. 2nd, at Grey Friars, Hutton Mount, Brentwood, Essex, the wife of Major B. Fraser Beatson, I.M.S. (ret.), of a son.

CAWTHORNE.—On Feb. 3rd, at Welbeck-street, W., the wife of Terence Cawthorne, F.R.C.S., of a son.

MARRIAGES.

TYLECOTE—PHYTHIAN.—On Feb. 6th, at Hitchin, Frank Edward Tylecote, M.D., F.R.C.P. Lond., Professor of Systematic Medicine in the University of Manchester, to Mable Phythian, Ph.D., late Warden of the Elvington Settlement, Kent.

DEATHS.

BROOK.—On Feb. 6th, at Mundesley, Norfolk, Samuel Stanley Brook, M.R.C.S., L.R.C.P., aged 46.

DAVIS.—On Feb. 4th, in a nursing home, London, Arthur Randall Davis, M.R.C.S., of Oaklands, Hythe, in his 77th year.

LILLIES.—On Feb. 5th, at Ashley-gardens, S.W., Arthur Chudleigh Lillies, son of the late George William Lillies, M.D., aged 73.

RAINSFORD.—On Feb. 4th, at Oak Lodge, Rolle-road, Exmouth, Colonel W. J. R. Rainsford, C.I.E., L.R.C.P.I., F.R.C.S.I., aged 80 years.

REBOUL.—On Feb. 4th, at Cannes, very suddenly, Dr. A. E. Reboul, L.R.C.P. Edin., M.D. Mont., of Châtelguyon and Cannes, aged 58.

SINCLAIR.—Suddenly on board M.V. *Reina del Pacifico*, Thomas Walker Sinclair, M.D., D.P.H., late Medical Officer of Health, Melbourne, Australia.

WILLIAMS.—On Feb. 2nd, very suddenly, Dr. Robert Stenhouse Williams, M.B., C.M., D.Sc., Director of the National Institute for Research in Dairying, University of Reading.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

L.D.S. Eng., Guy's ; J. B. Bamford, St. Bart.'s ; V. H. Barnett, Univ. Coll. ; P. Baron, M.B. Cape Town ; Mavis W. M. Beddall, Univ. Coll. ; R. B. Bell, Middlesex ; E. V. Bevan, Camb. and St. Mary's ; J. D. H. Bird, King's Coll. ; M. S. W. Bisdee, St. Mary's ; R. Biswas, M.B. Calcutta, Univ. Coll. ; W. D. Bower, Camb. and St. Thomas's ; H. W. L. Broadbent, Camb. and St. Mary's ; E. N. Brockway, St. Thomas's ; T. Bromberg, St. Mary's ; R. C. Brown, St. Thomas's ; Lilian M. Buxton, Birmingham ; T. A. R. Callender, London ; W. R. Cambridge, Bristol ; L. I. S. Campbell, Guy's ; W. H. Cartwright, St. Bart.'s ; T. Chadderton, Manchester ; B. Chandra, M.B. Bomb., King's Coll. ; T. L. Chester-Williams, St. Bart.'s ; E. M. Clark, St. Bart.'s ; K. R. D. Coles, Guy's ; G. H. Cooray, Univ. Coll. ; A. C. Cox, Oxf. and Guy's ; J. M. Cribb, Cardiff ; C. F. Cumings, King's Coll. ; J. Cunard, Guy's ; P. N. Cutner, M.B. Edin. ; Phyllis E. Dain, Birmingham ; B. R. Das, M.B. Calcutta, St. George's ; J. Davies, London ; Ursula D'Monte, M.B. Bomb., Royal Free ; D. P. Dewe, Bristol ; R. C. Evans, Univ. Coll. ; W. B. Evans, Camb. and St. Bart.'s ; R. M. Farrington, Cardiff ; T. Fichardt, Guy's ; J. H. Fisher, Camb. and London ; D. H. Fulton, King's Coll. ; G. Gimpelson, King's Coll. ; A. J. Grace, Guy's ; E. N. Hailey, Birmingham ; J. Halperin, St. Bart.'s ; O. C. Hamilton-Jones, Liverpool ; E. R. Hargreaves, Camb. and St. Mary's ; H. C. A. Harris, Camb. and St. Thomas's ; Helen A. Hatrick, Univ. Coll. ; Anne E. M. Herbert, King's Coll. ; C. A. Hodges, St. Thomas's ; Phyllis L. Holliday, Camb. and Leeds ; J. S. Horsley, London ; A. W. J. Houghton, St. Bart.'s ; J. Howkins, Middlesex ; N. D. Jekyll, London ; W. A. Johnson, St. Mary's ; E. G. Jones, Wales and London ; J. E. Jones, Liverpool ; W. W. Jones, Guy's ; M. Kamal El Din, Birmingham ; B. S. Kaushal, M.B. Punjab, Cardiff ; W. W. B. Kelly-Wischam, Middlesex ; R. G. Knight, Camb. and Guy's ; W. S. Larcombe, Guy's ; J. A. E. Lawn, St. Bart.'s ; Gladys A. R. Lenanton, Royal Free ; S. Levontin, London ; R. S. Lewis, Camb. and St. George's ; T. E. S. Lloyd, Camb. and St. George's ; D. P. Lockhart, St. Thomas's ; H. A. Lockhart, Durham ; Barbara R. Lockwood, Royal Free ; J. F. Lown, Camb. and St. Bart.'s ; J. Lubran, Guy's ; M. J. F. McArdle, Guy's ; J. J. McCann, St. Thomas's ; M. J. McCormack, London ; R. G. Macfarlane, St. Bart.'s ; H. A. Magnus, St. Bart.'s ; V. S. Majmudar, M.B. Bomb., Birmingham ; C. G. Malkani, M.B. Bomb., St. Bart.'s ; J. I. Maran, Univ. Coll. ; J. R. M. Martin, St. Bart.'s ; A. G. C. Mason, Middlesex ; J. B. Maurice, St. Mary's ; J. Metcalf, London ; G. A. Miller, Camb. and Guy's ; F. C. Moll, Westminster ; G. R. Morgan, St. Bart.'s ; R. B. Munro, Univ. Coll. ; Alice M. Naish, Camb. and Royal Free ; N. J. S. Nathan, Charing Cross ; R. W. Nevin, Camb. and St. Thomas's ; Elizabeth M. Ogden, King's Coll. ; G. H. C. Ovens, St. Mary's ; J. W. M. Owen, St. Mary's ; M. W. L. Owen, Camb. and St. Mary's ; W. M. Oxley, St. Bart.'s ; C. S. Patel, M.B. Bomb., A. J. Penglaze, St. Mary's ; B. J. Philbin, Manchester ; R. W. Pickering, Guy's ; S. H. B. Platts, Camb. and Leeds ; G. A. Powell-Tuck, Birmingham ; R. R. Race, St. Bart.'s ; S. Rameshwar, M.B. Lucknow ; G. R. C. Rayner, Guy's ; E. N. Rees ; Cardiff ; R. W. Riddle, Durham ; M. Ripka, London ; L. O. Roberts, St. Bart.'s ; M. L. Rosenheim, Univ. Coll. ; E. B. Rotherham, London ; F. W. Shepherd, St. Bart.'s ; S. M. Silverstone, Camb. and Guy's ; I. Singh, M.B. Punjab, London ; S. F. Smith, St. Thomas's ; S. B. Smith, Guy's ; V. C. Snell, St. Bart.'s ; Charlotte M. H. Sparrow, Royal Free ; J. Stern, London ; S. C. Suggit, Univ. Coll. ; F. Summers, King's Coll. ; R. Sykes, Manchester ; Annie C. Taylor, Camb. and Univ. Coll. ; W. S. Tegner, Oxf. and London ; Jessie A. Thirtle, Royal Free ; D. H. H. Thomas, Westminster ; H. B. Thomas, St. Thomas's ; Greta Traub, King's Coll. ; E. Troensegaard-Hansen, Charing Cross ; J. M. Vaizey, London ; C. B. M. Warren, St. Bart.'s ; W. H. C. Watson, Camb. and St. Thomas's ; G. D. Wedd, St. Bart.'s ; D. Whittaker, Camb. and St. Thomas's ; R. F. Winckworth, St. Thomas's ; and C. W. Wollaston, St. Thomas's.

Pathology.—G. Abbey, Leeds ; H. J. B. Atkins, Guy's ; Monica H. Austin, King's Coll. ; K. S. Ayyar, M.B. Madras, Middlesex ; R. H. Bailey, Camb. and King's Coll. ; V. H. Barnett, Univ. Coll. ; A. A. W. Beach, L.D.S. Eng., Birmingham ; R. H. Berry, Univ. Coll. ; J. D. H. Bird, King's Coll. ; M. S. W. Bisdee, St. Mary's ; R. Biswas, M.B. Calcutta, Univ. Coll. ; A. Bowen-Davies, Camb. and Guy's ; T. Bromberg, St. Mary's ; R. H. Brown, Camb. and Westminster ; L. I. S. Campbell, Guy's ; W. M. Capper, St. Bart.'s ; B. Cates, St. Bart.'s ; E. M. Clark, St. Bart.'s ; C. A. Clarke, Camb. and Guy's ; K. R. D. Coles, Guy's ; G. H. Cooray, Univ. Coll. ; J. Cunard, Guy's ; Anna V. K. Cyriax, Univ. Coll. ; Phyllis E. Dain, Birmingham ; W. H. D. Davies, St. Bart.'s ; E. A. Devenish, Univ. Coll. ; D. C. De Wet, St. Thomas's ; L. Dexter, St. Bart.'s ; E. M. Eggleton, Univ. Coll. ; G. J. Evans, Guy's ; Q. F. Evans, St. Thomas's ; T. Foulds, Manchester ; D. H. Fulton, King's Coll. ; A. H. Galley, King's Coll. ; D. W. Geidt, Oxf. and Guy's ; W. G. Gill, Camb. and Guy's ; L. Greenfield, London ; E. N. Hailey, Birmingham ; O. S. Heyns, Univ. Coll. ; A. W. J. Houghton, St. Bart.'s ; J. H. Hudson, Leeds ; A. D. Iliff, St. Bart.'s ; Ursula Y. im Thurn, Univ. Coll. ; D. K. Jardine, St. Bart.'s ; Ruby D. Johnson, Oxf. and Univ. Coll. ; R. L. Kennedy, St. Mary's ; S. H. Kessler, King's Coll. ; J. A. E. Lawn, St. Bart.'s ; S. B. Levy, Liverpool ; R. S. Lewis, Camb. and St. George's ; W. Lewis, Camb. and Guy's ; T. E. S. Lloyd, Camb. and St. George's ; [illegible] Camb., St. Bart.'s ; Mary A. McKean, Roya [illegible] St. Thomas's ; H. A. Magnus, St. Bart [illegible] King's Coll. ; G. F. Metcalf, Leeds ; R. B. Munro, Univ. Coll. ; J. B. C. Murdoch, Camb. and Guy's ; K. H. Nassif, Royal Free ; N. J. S. Nathan, Charing Cross ; R. W. Nevin, Camb. and St. Thomas's ; H. E. Offord, St. George's ; G. H. C. Ovens, St. Mary's ; E. D. Page, St. Mary's ; R. Parkinson, London ; R. V. Payne, Camb. and Guy's ; R. S. Pepperdine, Manchester ; R. W. Pickering, Guy's ; H. J. M. Robinson, Camb. and St. George's ; A. C. Rumsey, Camb. and London ; R. H. Rushton, King's Coll. ; B. F. B. Russell, St. Bart.'s ; B. Samuel, Cardiff ; S. B. H. Saunders, St. Bart.'s ; E. F. Scowen, St. Bart.'s ; V. M. Seifert London ; B. Shanovitch, London ; S. C. Shore, Guy's ; France E. Smart, Birmingham ; V. C. Snell, St. Bart.'s ; S. C. Suggit Univ. Coll. ; C. M. Vaillant, Oxf. and Liverpool ; H. B. D Vaughan, St. Bart.'s ; and Albertine L. Winner, Univ. Coll

Royal College of Physicians of London.

On Feb. 4th licences to practise were conferred upon 3 candidates (35 men and 2 women) who have completed th Final Examination of the Conjoint Board, and have complie with the by-laws of the College. *This list is supplementa* to that printed in our last issue. The following are th names and medical schools of the successful candidate viz. :—

J. H. B. Beal, Oxford and St. Bart.'s ; H. L. Beckitt, London F. J. Beilby, Camb. and St. Bart.'s ; H. W. Boake, Camb. an St. Thomas's ; J. A. Boycott, Oxford and Univ. Coll. ; H. T. I Broadway, St. Thomas's ; S. B. [illegible] Clark, London ; J. G. R. Clarke, [illegible] Coll. ; T. R. S. Cormack, Cam [illegible] Crowther-Smith, Guy's ; J. F. Dales, Univ. Coll. ; G. A. Desa L.M.S. Bombay, London ; R. D. Green, London ; K. H. Hester, London ; W. Holdsworth, St. Bart.'s ; E. T. Jone Cardiff and London ; K. D. Keele, St. Bart.'s ; W. S. G. Lawso St. Thomas's ; P. H. Lomax, Guy's ; I. A. MacDougall, Guy's G. J. McFarlane, St. Thomas's ; N. C. O'Byrne, St. Thomas's Norah W. K. Petter, Royal Free ; F. W. J. Platts, Camb. ar King's Coll. ; C. R. D. Porter, Middlesex ; T. W. H. Porte Oxford and Middlesex ; K. C. Priddy, London ; Pushpawat Punjab and Royal Free ; J. A. E. Scott, Oxford and Middlese J. R. S. Sharp, Guy's ; R. H. Smith, Camb. and St. Thomas's G. L. Talwar, Punjab and St. Thomas's ; J. C. S. Thoma St. Bart.'s ; A. A. M. Wajih, Bengal and Charing Cross ; ar G. Walker, London.

Royal College of Physicians of Edinburgh.

At a quarterly meeting of the College on Feb. 2nd, wi Dr. Robert Thin, the President, in the chair, Dr. Jam Douglas Allan Gray (Liverpool), Dr. John Gibb McC (Edinburgh), and Dr. Douglas Nairn Nicholson (Edinburg were introduced and took their seats as Fellows of t College. Dr. James Waters Thornton Patterson (Droitwic Dr. Jacobus Johannes de Waal (Johannesburg), and I William Lindsay Lamb (Aberdeen) were elected to t Fellowship.

Prof. K. F. Wenckebach, of Vienna, was appointed t George Alexander Gibson lecturer for 1932. Dr. Jam Crooks and Dr. Henry Joseph Rodway Kirkpatrick we awarded the Kirk Duncanson Fellowship for Medic Research, for one year. Lieut.-Colonel John Moriso I.M.S., was awarded the Parkin prize for the best essay the curative effects of carbonic acid gas or other forms carbon in cholera, the different forms of fever, and oth diseases.

London Inter-Collegiate Scholarships Board.

The Board announces that an examination for 14 medi *scholarships and exhibitions, and one* dental scholars of an aggregate total value of £1483, will begin on May 23 They are tenable at University College and Universi College Hospital Medical School, King's College and Kin College Hospital Medical School, the London (Royal F Hospital) School of Medicine for Women, and the Lond Hospital Medical College. Full particulars and entry fo may be obtained from the secretary of the Board, Mr. S. Ranner, the Medical School, King's *College* Hospit Denmark-hill, S.E.5.

National Conference on Leprosy in China.

We are informed that the first national conference leprosy in China will be held in Shanghai on April 14 and 15th, under the auspices of the Chinese Mission Lepers. The first day will be devoted to an appraisal the leprosy position in China, and to discussions on t methods most applicable to the special conditions in th country. The second day will be given to the considerati of problems of diagnosis and treatment. No special invit tions are being sent out, but it is hoped that leprologis from other countries will take part in the discussions.

Brighton County Borough Mental Hospital.

On Feb. 6th, the Mayor of Brighton opened an admissi hospital in connexion with the larger institution at Haywar Heath. There had been hopes of finding a suitable si for building in the grounds of the Mental Hospital, but t adjoining estate of Beechmont, a house of Georgian ty with 27 acres, came into the market, and it was purchas by the Brighton Corporation upon the strong recommend tion of the medical *superintendent,* Dr. G. H. Harpe Smith, and the Board of Control, need for relieving a certa amount of overcrowding in the main hospital having lo been insistent. The purchase price for the estate w £9225 ; £5400 has been spent on its adaptation, and abo £2600 on its furnishing. There is accommodation f 50 female patients at weekly payments ranging from thr to ten guineas.

NOTES, COMMENTS, AND ABSTRACTS

SOME COMMENTS ON THE CONSCIOUS MIND.*

BY ALEX. W. HENDRY, M.D. ABERD., M.R.C.P. LOND.,
ASSISTANT PHYSICIAN, ABERDEEN ROYAL INFIRMARY.

IT is perhaps permissible to doubt the wisdom of some prevalent tendencies in psychology. Previously metaphysicians considered consciousness a fundamental condition of all intelligence, and an invariable component of mental action. Present day psychologists would have us believe that most of our mental life is lived in the subconscious. If this be true, if such a state of affairs really exists, then it bodes ill for enlightened endeavour and progressive human advancement.

The subconscious mind has been enthusiastically studied—studied with an intensity which has destroyed the perspective and disturbed the general view of the mental field. It has become but a synonym for the devils and demons of the dark ages. The subconscious is charged with the harbouring of complexes which bring about serious mental discord and ill-health. These complexes may cause paralysis, anæsthesias, obsessions, amnesias, phobias, fits, and fugues. They chase happiness away, and bring untold misery and sadness to whomsoever may possess them. It would appear to be the teaching of the present, that the door to mental harmony lies in the subconscious mind. Have we no key to that door? Can we consciously and deliberately unlock the door? Or has the subconscious locked it against us?

An extensor plantar reflex occurs in, but is not due to a lesion of, the lower motor neurone. It is due to a loss of pyramidal influence. So the vagaries of neurotics are not due to any essential abnormality of the subconscious, but are phenomena associated with lack of higher control. In neurotic cases there is default in conscious mental processes. The unwelcome matter is sidetracked. It never really comes before the highest consciousness, and therefore, its associations are confined to subconscious realms. The "complex" is the result of default, and this default must necessarily be the essential factor in the production of neurotic states. In normal people the default is subject to correction by directive consciousness. The process of repression may be unwitting, but not, it is submitted, outside conscious control. Failure to face unpleasant facts is a weakness of the conscious mind. Normal people must face unacceptable affects, because if such are not consciously faced then repression definitely occurs.

It is noteworthy that Freudians find in all neurotic states evidence of repressed sexuality. These findings are not very convincing. It would be difficult to attribute war neurosis or railway spine to sexual complexes. Human beings have many interests, and while it is true that in psychopathic states of civil life, repressed sexuality is a very important factor, nevertheless, there are other affective states which, if incompletely mentalised, result in neurosis. Sexual complexes have nothing whatsoever to do with a great many cases. Another point is doubtful—Freudians trace complexes back to infantile life. These infantile complexes revealed by psychoanalysis are not in themselves causatively connected with adult neurosis except by regression. In cases of recent origin there has been either a mental deterioration or a new situation which cannot be adequately faced. Where no mental deterioration has occurred some present maladaptation exists—a lack of directive conscious ability for appropriate reaction. The infantile complex in these cases is but a regression, a revitalisation by transference of affect. Many psychopathic states traced to infantile sexual repression are due, not to these infantile complexes, but to a present maladaptation.

Some people there are who spend the major part of waking life in the subconscious. They are awake and yet they sleep. Their actions result from primitive impulses which are not understood, not judged, and not inhibited. Their actions are thus not moulded by the highest critical mental faculties. Perhaps most people are somehow partially cognisant of the true and real reasons for their actions, but few indeed are fully aware of the nature of their impulses, their source or their reason. Few people subject these impulses to the full scrutiny of their critical faculties, so that their final actions may be fully conscious, deliberate, and defined. Such people know themselves. The fuller the consciousness of daily life, the greater the degree of culture, the higher the grade of civilisation. As yet the integration of primitive and highest mental faculties is incomplete. Minds are not fully developed. Man himself must consciously and deliberately accomplish this. He must expand his realism to include his subconscious, only thus is the fullest consciousness possible. Further, mental evolution is likely, but this evolution must be deliberate, directive, and conscious. Man must evolve his own mind.

The division between the conscious and subconscious has been termed a "psychic filter." It is more like a barrier—a movable barrier which recedes as the conscious realm is enlarged. We must penetrate the dark areas, we must switch the mental floodlight from our environment right about into the dark recesses of our minds, and this is possible and is called "introspection." It is not for a moment suggested that children and juveniles are capable of introspection. It is, however, strongly urged that the normal adult would benefit greatly from observation of the inner mental self. The springs of energy should be examined and studied; then only could power be conserved and controlled. Impure springs could be cleansed, wandering streams collected and made to swell the volume of vital energy. Too often is man at the mercy of an all-devouring, harmful mental torrent. This harmful energy can only be harnessed for useful work if pure springs and straying streams are guided into peaceful channels filled with useful energy and quiet harmony. Evolution has brought man to a state of sentiency, and further progress depends on the use of this function. He must, if he would further improve, examine carefully and thoughtfully the mental springs, and he must consciously and deliberately direct their route. More consciousness is required, indeed a superconsciousness is requisite, and this is what we must strive to acquire.

Introspection will bring knowledge and knowledge will bring power, so that in the end man may be able to say truly, "I am the Captain of my Soul, the Master of my Fate." Cultivate then this all-pervading all-knowing consciousness. Know thou thyself. Let no mental ripple escape your consciousness, then you need never fear the subconscious and its terrors.

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[*] Substance of lecture delivered before the Aberdeen University Medical Society on Nov. 13th, 1931.

CONTROL OF MALARIA.

AT a recent meeting of the industrial antimalarial advisory committee of the Ross Institute, the formation of an Assam branch was reported, and Dr. G. C. Ramsay gave an account of the work that was being done to prevent malaria on tea estates in Assam and Bengal. A fifth research centre was, he said, being opened during the year. It was also announced that Dr. Ramsay had completed researches into the best oils for antimalarial mixtures and was now in touch with the Burma Shell Group with a view to making a standard efficient mixture available at all the oil

Medical Diary

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

Tuesday, Feb. 16th.—5.30 P.M., General Meeting of Fellows: Ballot for election to the Fellowship. 8.30 P.M., Pathology: Papers: R. M. Fry: The Isolation of Organisms in the Presence of *B. proteus*. R. J. V. Pulvertaft: Experiments in Rabbits with the Toxins of the Hæmolytic Streptococci. J. A. Murray: Mesenteric Metastases of the Rous I. Fowl Sarcoma. Spindle-celled Tumour with Prickle-cell Carcinomatous Metastasis. The Structure of the Gizzard. F. R. Selbie: Experiments on the Tomato-juice Sarcoma of Rats.

Thursday.—5 P.M., Dermatology (Cases at 4 P.M.). Short Paper: Dr. H. Windsor Wade (Culion Leprosy Settlement, Philippine Islands): Tuberculous Leprosy. Cases: Dr. H. W. Barber: 1. Telangiectasia macularis eruptiva perstans (Parkes Weber). 2. Acanthosis nigricans: forme fruste. Dr. G. B. Dowling with Dr. L. Forman: 3. Fox Fordyce Disease. Dr. J. M. H. MacLeod: 4. Acne Scrofulosorum. 5. Case for diagnosis. Dr. W. N. Goldsmith: 6. Bowen's Disease with Prickle-celled Carcinoma and Associated with Psoriasis. Other cases will be shown. 8.30 P.M. Neurology. Short Papers: Dr. C. P. Blacker: Human Pedigrees. Dr. J. le F. Burrow: The Phenomena of Regeneration in Peripheral Nerves After Suture. Dr. Ranyard West: Curare in Man.

Friday.—5.30 P.M., Physical Medicine. Paper: Dr. T. G. Kahlmeter (Stockholm): Modern Physiotherapeutic Measures. 8.15 P.M., Obstetrics and Gynæcology. Discussion: Gonorrhœa and Other Cervical Discharges. Opener: Colonel L. W. Harrison (St. Thomas's Hospital). 8.30 P.M., Radiology. Discussion: X Ray Treatment of Non-malignant Conditions. Short Papers: Dr. Russell Reynolds: 1. The X Ray Treatment of Mastitis and Certain Leukæmias. Dr. S. Gilbert Scott: 2. Recent Advances in the Treatment of Rheumatism and Asthma. Informal discussion on general subjects will follow.

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE, 26, Portland-place, W.

Thursday, Feb. 18th.—8.15 P.M., Dr. C. C. Chesterman: Some Results of Tryparsamide and Combined Treatment of Gambian Sleeping Sickness. (Demonstration at 7.45 P.M.)

CHELSEA CLINICAL SOCIETY, Hotel Rembrandt, Thurloe-place, S.W.

Tuesday, Feb. 16th.—8.30 P.M. (preceded by dinner at 7.30). Discussion on Medical Evidence in Criminal Cases. (To be opened by the Master of the Rolls and Sir William Willcox.)

SOCIETY OF MEDICAL OFFICERS OF HEALTH, 1, Upper Montague-street, W.C.

Friday, Feb. 19th.—5 P.M., Discussion on Rheumatism in the School Child. (To be opened by Dr. Gerald Slot, Dr. Francis Bach, and Dr. Vincent Coates.)

MEDICAL OFFICERS OF SCHOOLS ASSOCIATION.

Friday, Feb. 19th.—5 P.M. (at 11, Chandos-street, W.), Dr. William Moodie: The Significance of Abnormal Behaviour in Children.

ROYAL INSTITUTION, 21, Albemarle-street, W.

Thursday, Feb. 18th.—5.15 P.M., J. B. S. Haldane: Heredity in Man.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF PHYSICIANS, Pall Mall East, S.W.

Thursday, Feb. 18th.—5 P.M., Prof. Cyril Okell: The Rôle of the Hæmolytic Streptococci in Infective Disease. (First Milroy lecture.)

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, W.C.

Monday, Feb. 15th.—4 P.M., Mr. Wilfred Trotter: The Hunterian Oration.

Wednesday.—5 P.M., Prof. Le Gros Clark: Structure and Connexions of the Optic Thalamus. (Arris and Gale lecture.)

Friday.—5 P.M., *Prof. Le Gros Clark (lecture continued).*

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, London, W.

Monday, Feb. 15th, to Saturday, Feb. 20th.—Medical Society of London, 11, Chandos-street, Cavendish-square. Wed., 4 P.M., Mr. P. Lockhart Mummery: Lantern Demonstration, Diagnosis and Treatment of Diverticulitis.—East London Hospital for Children, Shadwell. Tues., Demonstration by Dr. Leonard Findlay, at 3 P.M.—Metropolitan Hospital, Kingsland-road, N. Thurs., Demonstration by Mr. C. Naunton Morgan, at 2 P.M.—Prince of Wales's Hospital, Tottenham, N. All-day course in Medicine, Surgery, and the Specialties, 10.30 to 5.30 P.M.—Royal Free Hospital, Gray's Inn-road, W.C. Fri., Demonstration by Prof. Dame Louise McIlroy, at 5 P.M. Further particulars from the Fellowship of Medicine.

NATIONAL HOSPITAL, Queen-square, W.C.

Monday, Feb. 15th.—2 P.M., Dr. Riddoch: Out-patien
Clinic. 3.30 P.M., Dr. Symonds: Disseminate
Sclerosis and Allied Conditions.

Tuesday.—2 P.M., Dr. Walshe: Out-patient Clini
3.30 P.M., Dr. Martin: Diseases of the Vertebr
Column with Nervous Symptoms.

Wednesday.—2 P.M., Dr. Martin: Out-patient Clinic.

Thursday.—2 P.M., Dr. Kinnier Wilson: Out-patie
Clinic. 3.30 P.M., Dr. Critchley: Cerebral Sclero
of Childhood.

Friday.—2 P.M., Dr. Adie: Out-patient Clinic. 3.30 P.
Dr. Walshe: Cerebral Tumours.

GUY'S HOSPITAL, London Bridge, S.E.

Monday, Feb. 15th.—5 P.M., Dr. A. E. Barclay: The U
of X Rays in Physiological Investigation.

ROYAL NORTHERN HOSPITAL, Holloway-road, N.

Tuesday, Feb. 16th.—3.15 P.M., Mr. F. Roques: Pregnan
in Association with Tumours.

HAMPSTEAD GENERAL AND NORTH-WEST LONDO
HOSPITAL.

Wednesday, Feb. 17th.—4 P.M., Dr. W. E. Gye: Canc

CITY OF LONDON MATERNITY HOSPITAL, City-roa
E.C.

Thursday, Feb. 18th.—5.30 P.M., Dr. H. C. Luce
Pathology of Pregnancy.

ST. PETER'S HOSPITAL, Henrietta-street, W.C.

Wednesday, Feb. 17th.—3 P.M., Mr. R. Ogier War
The Investigation of Hæmaturia.

ST. MARK'S HOSPITAL, City-road, E.C.

Thursday, Feb. 18th.—4.30 P.M., Mr. E. T. C. Milligo
Pruritus Ani.

UNIVERSITY COLLEGE HOSPITAL MEDICAL SCHOO
University-street, W.C.

Tuesday, Feb. 16th.—5.15 P.M., Prof. A. E. Boyco
Hypertrophy and Atrophy.

CHARING CROSS HOSPITAL MEDICAL SCHOOL.

Sunday, Feb. 14th.—10.45 A.M., Dr. R. A. Hickli
The Differential Diagnosis and Treatment of Brea
lessness. 11.45 A.M., Dr. S. C. Shanks: X
Diagnosis in Urinary Conditions.

KING'S COLLEGE HOSPITAL MEDICAL SCHO
Denmark-hill, S.E.

Thursday, Feb. 18th.—9 P.M., Dr. J. L. Livingst
Bronchiectasis—Its Prevention and Treatment.

LONDON SCHOOL OF DERMATOLOGY, St. John's Hospi
Leicester-square, W.C.

Tuesday, Feb. 16th.—5 P.M., Dr. M. Sydney Thoms
Lupus Erythematosus.

Thursday.—5 P.M., Dr. I. Muende: Pathology Dem
stration.

SOUTH-WEST LONDON POST-GRADUATE ASSOC
TION, St. James' *Hospital, Ouseley-road,* Balham.

Wednesday, Feb. 17th.—2.30 P.M., Dr. A. Salway:
to Oxo, Ltd.

CENTRAL LONDON THROAT, NOSE, AND EAR H
PITAL, Gray's Inn-road, W.C.

Friday, Feb. 19th.—4 P.M., Mr. H. Kisch: Treatmen
Cancer of Throat, Nose, and Ear by Radium.

CHADWICK LECTURE.

Thursday, Feb. 18th.—5.15 P.M. (at the Medical Soc
of London, 11, Chandos-street, W.). Dr. J.
Rolleston: Sir Benjamin Ward Richardson, his
and Work (illustrating epidiascope).

BRITISH INSTITUTE OF RADIOLOGY, 32, Welb
street, W.

Thursday, Feb. 18th.—8 P.M., *Prof.* M. S. Pembrey
others: Influence of Muscular Work on the Pas
of Food through the Stomach of Man. Dr. A. G
Taylor: Action of Radium D, E, and F with Collo
Bismuth upon Growing Tumours. Mr. W. J.
and Mr. L. H. Clark, Ph.D.: Quantity and Significa
of the Scattered Radiation produced in Water Subje
to Beams of X Rays and Gamma Rays.

Friday.—2 P.M., Mr. Philip Franklin and Dr. A. Or
Demonstration of Lipiodol Bronchography by
Nasal Route.—5 P.M., Cases for discussion.—5.30
Dr. F. Hernaman-Johnson: Experiments on
Projection of the Sphenoidal Sinuses through
Orbit. Dr. S. L. Mucklow: Relief of Pain in Rheu
toid Arthritis and Myositis Ossificans by Ray Thera

ROYAL INSTITUTE OF PUBLIC HEALTH, 37, Rus
square, W.C.

Wednesday, Feb. 17th.—4 P.M., Dr. A. R. Nelig
Organisation of Treatment for Industrial Rheumat

NATIONAL COUNCIL FOR MENTAL HYGIENE.

Wednesday, Feb. 17th.—5.30 P.M. (at 11, Chandos-str
W.), Dr. T. S. Good: Crime and Mental Abnormali

ST. MARY'S HOSPITALS, Manchester.

Friday, Feb. 19th.—4.15 P.M. (at the Whitworth-st
West Hospital), Mr. Morley: Birth Injuries
Their Treatment.

FACULTY HALL, St. Vincent-street, Glasgow.

Tuesday, Feb. 16th.—4 P.M., Prof. A. Young: Surg
Treatment of Minor Infections.

VICTORIA INFIRMARY, Glasgow.

Wednesday, *Feb.* 17th.—4.15 P.M., Mr. R. Tenne
Surgical Cases.

ADDRESSES AND ORIGINAL ARTICLES

THE COMMEMORATION OF GREAT MEN.*

BY WILFRED TROTTER, M.S. LOND.,
F.R.C.S. ENG., F.R.S.,
SERJEANT SURGEON TO THE KING; SURGEON TO UNIVERSITY COLLEGE HOSPITAL, LONDON.

I.

EVENTS that recur with a regular period are apt to be taken as a matter of course, to have their significance regarded as obvious, and to seem in no need of justification. To resist this tendency to confuse the familiar with the obvious is one of the most necessary efforts the mind is called upon to make. The institution whose recurrent activity we take part in to-day was set up 119 years ago, and marks a birthday since which 204 years have passed. For more than a century orations have been delivered on the life and work of Hunter, and they have explored their theme from every aspect and adorned it with every art. The high qualities of these orations make it impossible for a new contributor without special aptitude to hope for any freshness in the presentation of a topic already so well discussed by better men. On the other hand, the imposing length of the series may perhaps have a little obscured our apprehension of the more elementary meanings that underlie these regularly returning occasions. Under the pressure of these converging indications it will be my relatively humble task to seek answers to such questions as the first giver of this oration might be supposed in his preliminary musings to have put to himself. What are the reasons, we shall want to know, why John Hunter should be regarded as a fit subject for enduring celebration, and what do we wish and what do we attain in the many activities by which in general we pursue, or suppose ourselves to pursue, the commemoration of great men?

II.

To question established beliefs is nowadays perhaps a rather old-fashioned activity. We may be sure, nevertheless, that it is one of which Hunter would thoroughly have approved even if his own greatness was to be in question. In that case, however, if we are to judge by his known methods in controversy, the discussion would go all the smoother if we hinted beforehand what the verdict was to be. For of the verdict there can be no doubt, and it will find that the makers of this recurring celebration not only chose an exceptionally sound foundation but built perhaps a great deal better than they knew.

Hunter was a successful surgeon with a large practice and a correspondingly ample income. It must not be suggested here that that is anything but highly respectable attainment. It is not, however, attainment that, under any magnification or however many ciphers may be subtracted from the mortality of his patients and added to his income, reveals in its creator the heroic features we are seeking.

Hunter made the museum which for over a century has been the very focus and palladium of this College. In this work we find the giant energy and resolution of true greatness directed by a correspondingly clear and ample idea. It was no mere miscellaneous assemblage of odds and ends as the collections of his contemporaries tended perhaps a little to be, but a grouping of orderly series nobly illustrating the living world and the processes of disease. It is scarcely possible for the richness and order of this historic monument to be spoken of too highly, but it may be doubted whether in themselves they could have given to their creator his unique and enduring prestige.

Hunter was a consistent and expert user of the experimental method in the study of living processes, and it is on this fact that his fame essentially and ultimately rests. It was by impressing this method on his pupils and successors that his services to science and to surgery have had their most extended and their richest effects. These experimental studies covered a very wide field and dealt with fundamental problems such as the process of repair, the survival of isolated tissues, transplantation, grafting, inflammation, the processes of growth, and the influence on them of the sexual glands. Such researches were pursued with unfailing zeal and ability, and yielded results of importance in many directions. It is impossible, however, not to be struck by a certain disproportion between the amount of energy and genius that was expended, and the harvest of substantial knowledge that was gathered. Many of the researches were indecisive, not a few of the conclusions were incorrect, and no single advance was won which could be said to mark an epoch in the history of knowledge. Every student of Hunter is convinced that he belonged to the very small class of those who possess powers of the first order; few can be equally convinced that he made a direct contribution to the science of his day fully commensurate with his splendid gifts. It is therefore particularly happy that his commemoration should have been formally assured and entrusted to an enduring institution. Other experimental workers in the science of life, more fortunate but perhaps not more richly endowed, have by their labours so contributed to the very structure and substance of knowledge as to be sure of remembrance without any specific memorial. Of Harvey, of Pasteur, of Lister every student of physiology or pathology is in some sense the beneficiary and direct legatee. The influence of Hunter was more limited to the indirect and germinal; he did not make an epoch, he founded a school.

III.

That Hunter's prodigious powers and devotion yielded such comparatively moderate accessions to knowledge is perhaps not without a certain shade of mystery and pathos. It is an idle occupation for the common man to busy himself with explaining the successes and failures of greatness, but it is no undue presumption to turn our attention to the circumstances of Hunter's life in the search for light upon his career. He was so resolutely modern in his attitude towards the problems of life, and he accepted so whole-heartedly the working hypothesis of their solubility, that we are apt to forget the state of knowledge of his time. During the 65 years of Hunter's life from 1728 to 1793 the biologist could look for practically no help from the sciences of the inorganic, and was without almost every article of equipment we now regard as essential to experimental work. We are accustomed to associate with the earliest foundations of modern chemistry and physics the great names of Cavendish, Priestley, Galvani, Volta, and Lavoisier. Every one of them was junior depôts in India. A standard mixture for South Africa and Rhodesia had been established.

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* The Hunterian Oration delivered before the Royal College of Surgeons of England on Feb. 15th, 1932.

Mr. P. J. Parker, of the Roan Antelope Copper Mines, Rhodesia, testified to the remarkable results of the work of the Institute there; a large community of some 1800 Europeans and 12,000 natives were now practically free from malaria, mosquito nets were no longer necessary, hardly anybody took quinine, and the social status of the mines had undergone a complete change as the best type of white miner came freely. Sir Malcolm Watson said that he was leaving for a second tour of inspection, for he would not be satisfied by anything less than complete success. Despite the reduction of malaria to less than 5 per 1000 among white people, about 40 per cent. of the 1500 native children were infected, and these he hoped to cure. Sir Malcolm thought that, although Paris green might have a place in malaria control, it was not a substitute for oiling, since it allowed the female mosquito to alight anywhere and lay her eggs in perfect safety. It was quite incorrect to say that it was impossible to control malaria by antilarval measures alone; the disease had been practically stamped out, for example, in the Malay town of Klang without the use of a single grain of quinine. At the same time it was the duty of workers to cure the sick and particularly the children. He was taking two new drugs to Africa for experiment, for some of the results with plasmoquine had been disappointing.

Similar reports of success in stamping out malaria were brought from East Africa, South Africa, and Italy, illustrating the value of the work of the Institute to the commercial and industrial world.

STERILISATION OF THE TYPHOID CARRIER BY OPERATION.

FOR several years the problem of the typhoid carrier has been systematically studied at Gade's Pathological Institute in Bergen, the staff of which is making a survey of typhoid carriers over a large section of the west coast of Norway. Earlier communications have now been supplemented by a paper[1] in which Dr. T. M. Vogelsang and Dr. M. Haaland record 15 new cases, thus bringing up the total number of carriers studied by the institute to 14 men and 58 women. The case histories make sad reading; the fate of the typhoid carrier to-day is in one way even worse than that of the leper in the past. For the leper had often his fellow-sufferers as companions, whereas it is not the custom to form colonies of typhoid carriers—though this may be done eventually. Meanwhile what happens? One of the carriers included in the present survey was a widow for whom a cottage on a lonely island was provided by the local authorities. The inevitable happened, and her return to the haunts of her fellow-beings led to the usual crop of new cases, one at least of which was fatal. It is with such a background as this that the most radical operative interference must be judged; and it is encouraging to find in how great a proportion of cases operations on the gall-bladder sterilise the carrier. Among the 27 operations on the gall-bladder performed on carriers in the series under review, there were two at which the condition of the gall-bladder was found to warrant cholecystotomy alone. In one of these cases the carrier state ceased. Among the 25 carriers on whom cholecystectomy was performed, there were as many as 19 definitely cured. There was one death from operation, and another death 18 months later from tuberculosis, the excretion of *Bacillus paratyphosus* B having persisted after the operation. They had secured a footing in the liver in which necrotic tuberculous foci were found. Of the remaining four failures, two were associated with gall-stones, and it is probable that in both these cases the typhoid infection had ascended the biliary passages within the liver. In the remaining two cases the gall-bladder was found to be normal and the bile sterile. Presumably the typhoid bacilli came from some other organ.

Vacancies

For further information refer to the advertisement columns.

Aberdeen City (Fever) Hospital.—Jun. Rs. M.O. £100.

Auckland General Hospital, New Zealand.—Med. Supt.

Birmingham General Hospital.—Res. Surg. Reg. £100-£120 £140.

Bootle General Hospital, Nr. Liverpool.—Cas. O. and H.S.'s Each at rate of £150.

Bradford Municipal General Hospital, St. Luke's.—H.P.'s and H.S.'s. Each at rate of £200.

Brighton, Sussex Maternity and Women's Hospital.—Res. H.S £130.

Charing Cross Hospital, Strand, W.C.—Surg. Reg. £150. Als Obstet. Reg. £100.

Carlisle, Cumberland Infirmary.—H.P., 2nd H.S., and H.S. t Spec. Depts. Each at rate of £155.

Derby, Derbyshire Royal Infirmary.—Cas. O. £150.

Doncaster Royal Infirmary.—Sen. Cas. H.S. At rate of £175.

Dudley, Guest Hospital.—H.S. £200. Also Asst. H.S. £17

Elizabeth Garrett Anderson Hospital, Euston-road.—Obste Asst. £50.

General Lying-in Hospital, York-road, Lambeth, S.E.—Jun. Re M.O. and Anæsthetist. At rate of £100.

Great Yarmouth General Hospital.—Sen. and Jun. H.S.'s. A rate of £150 and £140 respectively.

Hospital for Consumption and Diseases of the Chest, Bromplo S.W.—Physician. Also Asst. Physician.

Huddersfield Royal Infirmary.—H.S. At rate of £150.

Islington Dispensary, 303, Upper-street, N.—Asst. Res. M. £250.

Leeds University.—Lecturer in Experimental Pathology a Asst. Director of Cancer Research.

Leicester Royal Infirmary.—H.S. and H.P.'s. Each at rate £125.

Liverpool City.—Asst. Tuberculosis O. £500.

Liverpool, Royal Babies Hospital, Woolton.—Res. M.O. At ra of £90.

London Lock Hospital, 91, Dean-street, W.—Surg. Reg. £1

London Lock Hospital, Harrow-road, W.—Surg. Reg. £100.

Maidstone, West Kent General Hospital.—H.S. £220.

Manchester, Ancoats Hospital.—Two H.S.'s. Each at rate of £1 Also Med. Reg. £50.

Manchester Babies Hospital, Burnage-lane, Levenshulme.—Ju Res. M.O. At rate of £50.

Manchester and Salford, Hospital for Skin Diseases.—H.S. rate of £100.

Manchester Royal Eye Hospital.—Jun. H.S. £120.

Margaret-street Hospital for Consumption, W.—Hon. As Phys.

Metropolitan Hospital, Kingsland-road, E.—Surgeon.

Northwood, Middx., Mount Vernon Hospital.—H.S. £150.

Nottingham General Dispensary, Broad-street.—Res. Surge £250.

Paddington Green Children's Hospital, W.—Hon. Dental S. a Hon. Surgeon to Out-patients.

Plymouth, South Devon and East Cornwall Hospital.—H.S. rate of £100.

[illegible] Hon. Surgeon.

[illegible] *Hospital.*—H.P. At rate of £1 £180.

[illegible] *Inn-road, W.C.*—Asst. Surgeon Ear, Nose and Throat Dept.

Royal National Orthopædic Hospital, 234, Great Portland-str W.—Hon. Dental Surgeon.

Royal Waterloo Hospital for Children and Women, Waterl road, S.E.—Hon. [illegible] Also Hon. Med. R

Salford Royal Hospita [illegible] *N.W*

Samaritan Free Hosp [illegible] H.S. At rate of £100.

Sheffield, Jessop Hospital for Women.—H.S. At rate of £1

Sheffield Royal Hospital.—Res. Anæsthetist. At rate of £100

Shrewsbury, Royal Salop Infirmary.—Res. Surg. O. £250. A Cas. O. and Res. Anæsthetist. At rate of £160.

Southern Hospita [illegible] Med. Supt. £1100.

Southern Rhodesi [illegible] and Relieving G M.O. £500.

South Shields, Ingham Infirmary.—Sen. and Jun. H.S.'s. £ and £150 respectively.

South-Western Fever Hospital, Landor-road, Stockwell, S.W Res. Med. Supt. £900.

Stoke-on-Trent, North Staffordshire Royal Infirmary.—Orthop H.S. £150.

Sudan Medical Service.—Three M.O.'s. Each £E.720.

Tancreds Studentships.—Three Students. Each £100.

Tunbridge Wells and C [illegible] —H.S. £160

Ventnor, Isle of Wight, [illegible] *for Consumpti* Sen. Asst. Res.

Western Dispensary, Rochester-row, Westminster, S.W.—F M.O. and Dispenser. £150.

West London Hospital, Hammersmith-road, W.—Hon. As

[illegible] *spital, Harlesden-road, N.W.*—Hon. 2

[illegible] *VII. Hospital.*—Res. M.O. £200.

The Chief Inspector of Factories announces vacant appointme for Certifying Factory Surgeons at Kingston (Surrey), Presteign (Radnor).

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[1] Norsk Mag. f. Laegevidenskaben, November, 1931.

increasing divergence between the subject commemorated and the object commemorating has perhaps its consolations when we view the objects of memorial art in our public places. At any rate, we may tell ourselves as we shrink before the marble frock coats and the bronze beards and whiskers, their supposed subjects could scarcely have been like that. However forlorn in the eyes of mere reason the task of keeping in being the veritable personality of the dead, mankind has addressed itself to this object throughout the ages. And its efforts have always illustrated the twin themes of pity and fear. The hunter warrior must have his weapons and his dogs with him in the grave, the head of the house his servants and his wives, and both their finery and their food. So they would be happy and at ease, and the bereaved could feel a little comforted; and if they were happy and at ease perhaps they would not come back.

When the dead man is a great man, another theme is added revealing motives with the same rich human mixture of the noble and the base. The qualities of the hero are worshipped, are desired, and are pursued with devotion and without scruple. Primitive man seems very early to have thought the most obvious way to assimilate the virtues of the hero was to assimilate his body, actually to eat his flesh in the expectation that the spirit which had animated it would also be conveyed and absorbed—a robuster conception of organotherapy than we have yet come back to. Hence arises the commemorative feast which has penetrated Western civilisation with what huge significances we know. A second idea which belonged more definitely to the realm of magic was to make an image of the hero, and so preserve his personality without limit; thus the qualities most desired could be judiciously magnified, and, above all, the whole conception was under control.

But the primitive mind with its dangerous gift of logic could not leave the subject without further rational expansion. If heroic virtues are transferable at death, must one wait upon the operation of mere natural processes? We need not doubt that the plain conclusion has been on due occasion reached. When the slayer was assured of acquiring the virtues of the slain, the crazy logic of memorial piety had reached its climax. This dark theme wanders elusively in the customs and folk-lore of early man, and has its classical seat where in the shadowy southern woods we discern the enigmatic figure of the Priest of Nemi with the Golden Bough.

It would be easy to fall into absurdity by making crude and over-simplified applications of these primitive modes of thought to our modern affairs. Nevertheless we must not forget the ingrained conservatism of Nature; physiology has shown to how large an extent the fundamental chemistry of the body and the elementary working of the nervous system tend to be uniform throughout the animal world.[1] There is good reason to suppose that the same kind of elementary uniformity obtains, and has always obtained, in the reactions of men's minds. If the ideas we have indicated occurred in primitive minds we may be sure that manifest or latent evidences of them will be found in our own. At any rate, we cannot deny that the commemorative feast has its part in modern memorial celebrations; or that man still likes to make magic images of his heroes—though there may be little enough magic about some of them—and to magnify the features he thinks they ought to have, and suppress the others.

It would partake too much of the nature of the overstrained ingenuity I have already deprecated to enlarge upon the traces of what we may call the Golden Bough theme that are to be found in the treatment by society of its men of exceptional character and capacity. Such traces are to be met with, but they are perhaps too elusive to be put into words without an effect of crudity and exaggeration.

V.

The *conscious* and *ostensible* motives under whose influence we approach the commemoration of great men are first, to contemplate in humble piety and emulation a largeness of mind and character that far exceed our own; and, secondly, to seek inspiration from struggles heroically engaged and perhaps triumphantly won. There is no commoner mistake in practical psychology than to suppose that because a motive is admirable it must therefore be strong. If we are to be honest with ourselves we shall have to admit that aspirations such as these do not accompany us very far along the humdrum and ignoble ways of daily life. Many of us, I fear, must have felt guiltily conscious of how little the exhilaration produced by such exercises has been able to compete with the trivial anxieties and ambitions of our own pedestrian lives. Side by side with this weakness in our conscious motives there is, as I have hinted, reason to suspect the presence of other and submerged impulses, the vestiges of a cruder, harsher, type of feeling, which for all their dimness may have a certain ugly strength. When we remember, in addition, the difficulty of establishing and keeping alive the true and unadulterated personality of the dead, we must, I think, confess that the art of ceremonial commemoration has to overcome obstacles of a very formidable kind if it is to avoid becoming increasingly formalised and superficial.

It is possible that a future and more realistic age may reach the conclusion that the time to celebrate its heroes is while they are alive, and not to wait with our remarkable patience until they are safely dead. Such an age will perhaps reason in its clear way that its duty towards its great men is to get as much out of them as it can, and that no piety after their death can equal in effectiveness for the purpose a receptive and sympathetic understanding during their lives.

VI.

It is unfortunately very much easier to recognise a man's greatness after he is dead and when we are freed from the distraction of the actual presence which unhappily tends so often to be odd, angular, and even quarrelsome. It is also an old story that the reception of new ideas tends always to be grudging or hostile. The text is a favourite one, and is apt to become the theme of exhortations which, in addition to having the dreariness of their kind, are pointless because they constitute a frontal attack on an ingrained quality of the mind.

Apart from the happy few whose work has already great prestige or lies in fields that are being actively expanded at the moment, discoverers of new truth always find their ideas resisted. The consideration of this process is often obscured by two assumptions: first, it is supposed that the most harmful resistance comes from obvious and noisy prejudice, and that the resistance of inertia and quasi-rational negation is unimportant; and, secondly, it is supposed that workers in science are of course free from any to Hunter. Let us for a moment regard the situation of Hunter in his prime in 1765. He would have had to wait ten years for Priestley's discovery of oxygen in 1775; he would have had to wait over 60 years for Wohler's synthesis of urea and the foundation of biochemistry in 1828, and nearly 80 years for Joule's mechanical equivalent of heat. Over 60 years ahead was Joseph Jackson Lister's completion of the compound microscope, which made possible the science of histology, and exactly a century away, the proof of the nature of wound infections by Lister's greater son.

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[1] Hopkins, Sir Gowland: Anniversary Address, Proc. Roy. Soc., January, 1932, p. 420.

In this atmosphere of embryonic science and primitive equipment Hunter worked with high faith and energy at problems which have resisted, or yielded only grudgingly to, all the resources of the modern world. Not only was there little help for him in the general body of science, but biology itself lay in a certain sense between two tides of inspiration. The gross structure of the animal body had been fully exploited by the great anatomists; the stimulus this had given to knowledge had come to the flood and was ebbing fast. Exact histology lay half a century in the future, and for the want of it most of Hunter's experiments could not be given full exploitation or carried to exact conclusions. It needs all our imaginative sympathy to picture the twilit country in which his labours were carried on—the air is dim and thick, the range of vision short, the appearance of things ambiguous,

> —"the tired waves vainly breaking
> Seem here no painful inch to gain."

We can scarcely resist the sense that there was a prophetic element in the feverish energy with which he set himself to his tasks. For events were to give to such work a new value and a new necessity The long climax of the eighteenth century was passing by. Ahead lay a changed order where social structure would have an unheard-of complication and biological problems an unheard-of urgency. The world seemed to pause, gathering itself for the plunge. The movement would be slow at first but presently would take on a vertiginous acceleration.

In 1774, when Hunter was 46 and in the full tide of work, a young Scotchman named James Watt left Glasgow for Birmingham to become the partner of Matthew Boulton, and with his help to add to the gathering forces of the industrial revolution the immense momentum of the steam-engine. There followed a commercial expansion and a crude industrial hypertrophy which made this country the envy of the world, but which we can now contemplate with only a qualified pride. The growth of trade and population was so imperious and so exuberant that the ordinary hygienic difficulties of social life increased out of all bounds. Industrial areas of population grew unchecked by regard for space, for decency, or for health, while the discrepancy between the rate of development of mechanical and biological knowledge became more and more dangerously wide. The great, but as we can now see rather Grecian, gift made by the North to the South, when James Watt brought the steam-engine to England, was to be repaid in a nobler and less equivocal form when 86 years later a young Englishman named Joseph Lister went to Glasgow. The industrial revolution and the steam-engine had done their work. To the great new industrial populations hospitals had become more and more indispensable, and with every enlargement of their activities they had become more and more dangerous to their surgical patients. The process was a progressive one for a reason that is now obvious, the frequent occurrence of infection from patient to patient being ideally suited to raising the virulence of micro-organisms to the highest pitch and maintaining it there. Surgery in hospitals was in fact already threatening to become extinct.

It was in this darkest hour that the method of Hunter brought off its greatest stroke. Of that method Lister was a devout and explicit disciple. In five years from his going to Glasgow he had solved the problem of wound infection and modern surgery was born.

The lapse of time, with its slow revelation of perspective and proportion in the succession o events, seems more and more clearly to teach th lesson of Hunter's career. It was not as a surgeon as the maker of his great museum, or even as discoverer in science, that his greatness was reveale or his influence perpetuated. It was by his exampl in the use of the scientific method—faithfully, i purity of heart, and with utter devotion to truth.

IV.

We cannot examine even in this hasty way the specia instance of a given memorable man without feelin a logical pressure towards the consideration of th more general case, of the meaning and motives tha underlie one of the most widespread of human impulses We assume that the commemoration of heroes i possible and to be desired, and it would perhaps b well in prudence to leave it at that, for the momen we pierce the smooth surface of the assumption w find ourselves in a world of ambiguities and uncomfortable hints. Nevertheless, it is perhaps a health exercise in an environment such as this—so soli so stable, so justly confident—to recall to ourselve sharply that these also are appearances.

Let us begin by planting squarely before us th plain fact of death. I make that specious reques not in the expectation that it will be granted, for is in the very nature of that fact's relation to li that we cannot get a square, collected, and, as it wer binocular look at it. A living mind can form n intimate conception of its own death, and is apparentl for ever incapable of comprising two categories whic are not opposites, as is often crudely supposed, bu superlatively different. And yet in the world gross reality the expectation of death for the individu is the one prospect for which the attestation experience amounts most nearly to philosoph certainty. This radical antinomy in the life of eve conscious being, in spite of having been the chi preoccupation of the speculative mind since it cam into existence, remains and must remain unresolve Among the by-products of these secular activiti is the strange jumble of sense and fantasy that mak up our attitude towards the memory of the dead.

In even its most sober and enlightened momen mankind has regarded the dead with fear and pit In other moments the feeling has risen to awe an reverence, or has sunk to a strange blend of horr and contempt. The mixture of feeling has withdraw attention from the central fact, that from the momen of a man's death the memory of him begins to fad for he has entered on a new state about which th only certainty is that it has nothing to do with lif Nothing can arrest this decline, no memorial can d more than delay it, and as it delays distort. In a our commemorations. whether by word or by plasti art, we make our own pictures and drift increasingl away from the actual man. These are the re ghosts, and nothing brings more certain convictio of a man's death than his memorial. This steadil illimitable ocean of biology before him, and he addressed himself unhesitatingly to explore it all. It was in the general level of knowledge and in instrumental equipment that he was less fortunate. When a new Hunter appears he will not be held back by an undeveloped science, and he will find this College able to give him all the facilities with which it has been munificently endowed. Let us hope that he will also find an intellectual environment where even his most revolutionary ideas will be planted in a nourishing soil and bathed in a genial air.

ARTERIAL ATONY AND ARTERIO-SCLEROSIS.

BY J. PLESCH, M.D.,

PROFESSOR OF INTERNAL MEDICINE IN THE UNIVERSITY OF BERLIN.

THIS paper sets out the thesis that arterio-sclerosis is only one phenomenon in a constitutional systemic disease affecting more particularly unstriped muscle. The disease is by no means restricted to local areas; on the contrary, it attacks the whole vascular system simultaneously. The local changes, which we call atheroma, athero-sclerosis, ossification of the arteries, and a number of other names, serve the purpose of strengthening the walls of excessively dilated blood-vessels at points of greatest strain. Arterio-sclerosis is a disease that sets in at every age, that can be arrested, and that can be cured in the early stages and beneficially influenced in the later stages; it is not an ailment of old age which must of necessity be progressive and incurable.

Even by purely local observation, it would be possible to distinguish between two forms of arterio-sclerosis—namely, the arterio-sclerosis of old age, due, in the strict sense of the words, to wear and tear, with its local atheromatous calcified areas as secondary mechanical hysteresis, and arterio-sclerosis as a disease in itself, a constitutional systematic allergic primary affection of the smooth muscles, the sympathetic nerves, and the connective substance. These two types appear clinically quite independently of each other. Even though the pathological anatomical alterations show no characteristic indications of the one or other type of the disease, and even if the histological pictures are vague or very much alike, we are, nevertheless, compelled at the bedside to make a clear distinction between these two forms of the disease for a very great number of reasons. Just as we are quite content to look upon presbyopia as a natural wear-and-tear disease of the eye but are wont to regard all hypermetropia originating from other causes as a disease, sui generis, so also must the "presbyopia" of the arteries be distinguished from arterio-sclerosis as a disease.

The essential characteristic of arterio-sclerosis cannot be the deposition of lime, for at every age, even in infancy, lime is found in the arterial walls in a surprisingly large number of cases. The primary cause of arterio-sclerosis is the weakening both of the muscular and of the elastic elements of the walls of the blood-vessels. If the weakened blood-vessels are not able to offer sufficient resistance to the blood pressure they become stretched and dilated. At points particularly exposed to dynamic pressure alterations occur which in the end serve no other purpose than to raise the resistance of the walls. This process of alteration, which is completed by the deposition of lime plates, offers protection against rupture. Calcification and ossification are, therefore, not a disease but a healing process. The first local changes caused by excessive wear and tear in parts of the vascular walls are anatomically characterised by proliferation of the tunica intima at quite an early stage.

L. Ernst, in his excellent investigation, was able to study the differentiated structure of the muscular and elastic elements of the vascular walls. These investigations substantiate a clinical assumption which we made some time ago—namely, that the various layers and the specific elements of the arterial walls are involved to a varying degree in the disease process. Corresponding with the longitudinal and transverse tonicity of vascular walls, there must be longitudinal and transverse muscles that act independently of each other. The tone of the specific elastic elements must also be taken into account, because longitudinal extension narrows a blood-vessel, and an excised blood-vessel becomes shorter. The two muscular symptoms are functionally, and therefore also clinically, quite dissimilar in their behaviour. The annular muscles counteract more particularly the internal pressure of the blood-vessel, and the longitudinal muscles its longitudinal extension, while the elastic fibres of the artery regulate both strain and pressure.

Pathological Anatomy.

In addition to these arguments, mention must also be made of the following pathological anatomical factors:

(1) The atheromatous changes and calcifications occur at points most exposed to the impact of the dynamic force and where the whirl of the blood stream is strongest. Consequently the points of predilection must lie at the bends of the channel; in the aorta the points involved are the bulb and the posterior wall, and, more particularly, those points where the arteries branch off. Further, calcification chiefly takes place in those arteries most subject to wear in consequence of increased local pressure; for instance, in manual labourers in the arteries of the right arm, in waiters in the arteries of the legs.

(2) It is exceedingly uncommon for an artery to rupture at the point of calcification. So, even in sanguineous cerebral apoplexy, we hardly ever see a rent in the calcified area, practically always in an apparently intact part.

(3) Everywhere in the human body where encapsulation takes place as the result of a morbid process (tuberculosis, echinococcosis, myomata, cysts of all kinds) we find calcareous deposits besides an accumulation of cholesterin. There is nothing to prove that arteries in this respect fall into a different category.

(4) That the more heavily taxed parts of the blood-vessel require an arterio-sclerotic protection can be proved by the nodular form of arterio-sclerosis. We find the latter in arteries which are curved and show numerous branches—e.g., the coronary arteries, the carotids, the cerebral vessels, the subclavian artery, and the arteries of the intestines. Arteries that can easily be moved in their substratum, such as the arteries running across the joints, are not involved (G. Oberndoerfer). In unilateral goitre, the curved, laterally displaced, carotid artery becomes calcified, while the normal undisplaced carotid remains unchanged. On the other hand, diffuse arterio-sclerosis appears in arteries which in parts have a straight course with but few branches. Here there is a uniform thickening along the whole length of the vascular walls due to the action of increased local

resistiveness beyond a rational conservatism. Each of these assumptions is an almost complete delusion.

The vociferous opposition met with by the ideas of Charles Darwin and of Lister probably did nothing to hinder the spread of these, and probably brought them within reach of a larger number of people capable of accepting them than would have been the case if the opposition had been well behaved. Again it was not noisy prejudice that caused the work of Mendel to lie dead for 30 years, but the sheer inability of contemporary opinion to distinguish between a new idea and nonsense. That this same inability may be shown even by the most eminent workers in science scarcely needs demonstration for anyone at all aware of the history of knowledge, but it may be illustrated by an anecdote which we owe to the third Lord Rayleigh and which is to be found in the delightful *Life*[2] of that very great and wise man. J. J. Waterston was an engineer who interested himself in mathematical physics, and in 1845 wrote a paper on the molecular theory of gases which was 10 or 15 years in advance of his time and anticipated much of the work of physicists no less eminent than Joule, Clausius, and even Clerk Maxwell. The only contemporary judgment on this paper that survives is that of the referee of the Royal Society to whom it was submitted. He said: "The paper is nothing but nonsense." What Waterston might have accomplished if he had had the recognition and encouragement upon which this genius seems to have been unusually dependent, is beyond conjecture. He did not get them. His work lay in utter oblivion for 45 years until it was exhumed by the pious efforts of Rayleigh. He himself lived on disappointed and obscure for many years, and then was overtaken by a yet deeper obscurity, for as the results of some strange accident, or a long gathering impulse of despair, he disappeared and left no sign.

This little story must strike with a chill upon anyone impatient for the advance of knowledge, and especially upon such as are inclined to assume the use of the scientific method to be synonymous with the possession of the scientific mind. Experience fully proves that this assumption is unsound, for there is no limit to the narrowness of the field within which the scientific method may be limited while the rest of the mind is uninfluenced. Even if that assumption is not maintained there are several grounds on which has been defended the proposition that a man of science does well not to traffic very freely with new ideas. It is thought that the necessary concentration on a limited problem is apt to be attenuated by the use of any general intellectual activity. A proposition more worthy of serious attention is that which declares that scepticism and suspended judgment are the very essence of the scientific mind and scarcely to be depended on too much. The conception is no doubt true when its elements are exactly defined. Without such definition these venerable phrases may very easily become mere snares; this is because they are apt to be the expression not of the principles they profess to represent but of far more deeply ingrained and potent impulses.

The mind delights in a static environment, and if there is any change to be itself the source of it. Change from without, interfering as it must with the sovereignty of the individual, seems in its very essence to be repulsive and an object of fear. A little self-examination tells us pretty easily how deeply rooted in the mind is the fear of the new, and how simple it is, when fear is afoot, to block the path of the new idea by unbelief and call it scepticism, and by misunderstanding and call it suspended judgment. The only way to the serene sanity which is the scientific mind—but how difficult consistently to follow—is to give to every fresh idea its one intense moment of cool but imaginative attention before venturing to mark it for rejection or suspense, as, alas, nine times out of ten we must do. In this traffic it is above all necessary not to be heavy-handed with ideas. It is the function of notions in science to be useful, to be interesting, to be verifiable, and to acquire value from any one of these qualities. Scientific notions have little to gain as science from being forced into relation with that formidable abstraction, "general truth." Any such relation is only too apt to discourage the getting rid of the superseded, and the absorption of the new, which make up the very metabolism of the mind.

VII.

In making this small survey of the simpler reflections that are suggested by commemorative occasions such as this, three general conceptions have presented themselves rather prominently. Some of them at least have a practical bearing, and we should therefore be very unworthy disciples of the Master we celebrate if we did not give them what point we can by a particular reference.

The first of these ideas is the familiar truth that if any human institution is looked into at all closely it is found, however admirable its ostensible purpose, to be built out of a strange mixture of elements and to comprise motives, many of them odd and some of them ugly. Memorial ceremonies show themselves to be of this class, and thereby demonstrate that they possess a thoroughly natural origin. In these mild disclosures there is nothing to dismay, and no one need be disconcerted by the homely skeletons in the cupboards of folk-lore. At the same time they perhaps have a use in explaining why the stimulation and enlargement of mind afforded by such commemorations are sometimes less potent than we could wish.

The second conception that emerges is the suggestion that with the process of time it will become increasingly difficult to separate the commemoration of the dead from the responsibility for their treatment during life, or to believe that posthumous honour is in any real sense a reparation for the dead, or a discharge of the liability of the living. It will become less and less possible to regard the discoverer of truth as responsible for the propagation of it, and charged with the duty of converting a stiff-necked generation.

The third and last idea on which our discussion has converged is that if mankind is to profit freely from the small and sporadic crop of the heroically gifted it produces, it will have to cultivate the delicate art of handling ideas. Psychology is now able to tell us with reasonable assurance that the most influential obstacle to freedom of thought and to new ideas is fear; and fear which can with inimitable art disguise itself as caution, or sanity, or reasoned scepticism, or on occasion even as courage.

We may now attempt for a final moment to link these speculations with our primary theme. In his mental environment Hunter must be regarded as a happy man. He lived in the relative intellectual freedom of the best part of the eighteenth century, before its bland sunshine had died in the smoke of industrialism, and before the French Revolution and the reaction to it had deadened speculative thought. He saw, as from a peak in Darien, the hanges, most of them involving the coronary arteries. Similar observations have been made in other countries. The statistics show that arterio-sclerosis is by o means necessarily progressive, and also that it must e curable. Seeing that the mortality figures for rterio-sclerosis are something like 6 per cent. of the otal mortality, a fraction which bears no relation whatever to the morbidity figures, it follows on the one hand that we have over-estimated the danger of arterio-sclerosis, and on the other that many cases must have recovered spontaneously. Anitschkow and his school have reported complete cures, even in severe and far-advanced arterio-sclerosis (Wolkoff).

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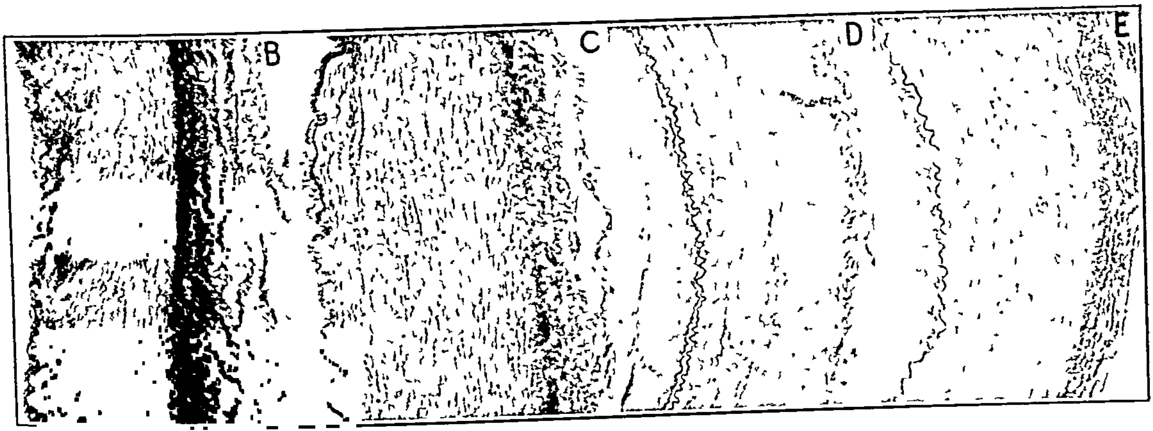
[2] Life of Lord Rayleigh. London, 1924, pp. 169 et seq.

FIG. 1 (B–E).



Transverse sections of (B) healthy artery not under pressure; (C) healthy artery under pressure; (D) diseased artery not under pressure; (E) diseased artery under pressure.

The Clinical Proofs.

I shall confine myself to the symptoms characteristic of arterial atony.

(*a*) *Volume of pulse.*—The tonoscillogram[1] gives us a volume and pressure curve and enables us not only to determine the pressure of the blood-vessel itself apart from the blood pressure, but also the volume of the pulse. In cases of arterial atony the increase in the volume of the pulse was, in many instances, several times greater than normal. As the pulse volume cannot increase without dilatation of the blood-vessel, it readily follows that arteries must be atonic, with attenuated walls in the early stages of arterio-sclerosis. From the height of the greatest oscillation as measured at the rings of the tonoscillogram it is possible to calculate the absolute volume of the artery by introducing a so-called normal volume scale.

(*b*) *Vascular pressure.*—The tonoscillogram also shows that the vascular pressure is considerable less than the normal—a further indication of the reduced elasticity of atonic arteries. For instance, Fig. 2A shows a normal artery with an opening pressure of 24 mm. Hg, and Fig. 2B taken from an atonic artery, shows an opening pressure of only 8 mm. Hg. The tonoscillogram of a thickened vascular wall in a late stage of arterio-sclerosis shows a vascular pressure of 50 mm. Hg. Moreover, the sudden rise in the oscillation and the sharp bend at the point of maximum pressure are proof that the parting of the non-elastic wall followed as suddenly as it did in our experiments with thin-walled non-elastic tubes (prepared amniotic coating). Quite in accordance with these observations, the normal tonoscillogram (Fig. 2A) shows, besides an opening pressure curve of normal length, a uniform increase in the excursion of the oscillations; in the thick-walled artery (Fig. 2C) this increase corresponds to a drawn-out curve. In Fig. 2B, on the other hand, the oscillations rise suddenly without transitional stages and diminish with equal suddenness.

An atonic vascular system harbours serious dangers for the whole circulation. An important factor is that the air chamber action of the arteries (Otto Frank and others) is impaired. To compensate for the loss of these circulatory components the heart must become hypertrophic, and that at a stage when the capillary resistance is hardly yet increased. In this way, where the total pressure is normal or below normal, the included blood pressure can be high simply because the vascular pressure is very low.

(*c*) *Blood pressure.*—While H. Huchard regards an increased blood pressure as a regular concomitant of arterio-sclerosis, E. v. Romberg states that "in accordance with anatomical observations there is as a rule no increase in blood pressure in uncomplicated cases of arterio-sclerosis measured with the Riva-Rocci apparatus (Sawada, Groedel, Ferranini, Lukacs); only in 12·3 per cent. of the patients examined did Sawada find a moderate increase.'

I am of the opinion that in the early stages of arterio-sclerosis both high and low blood pressures can be found. The important factor is not so much the absolute blood pressure as its extraordinary instability. Occasionally variations of 50 mm. Hg and more can be observed within the space of a few minutes. Tonoscillography enables us to record graphically and to follow accurately changes in blood pressure under the most diverse conditions. If the variations are accompanied by other characteristic tonoscillographic indications, these afford further corroboration of the correctness of the diagnosis.

The stability of the blood pressure is vouchsafed by the prompt compensatory reaction of the elastic and muscular apparatus of the blood-vessels. If this apparatus is impaired, as it is in arterial atony, even the smallest demand made upon it must produce variations in pressure, which in health are readily compensated.

Further diagnostic characteristics of arterial atony can be obtained by the tonoscillographic method of measuring blood pressure, if the relation between the pressure, such as we see in the blood-vessels of the extremities.

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[1] Plesch, J.: "Tonoscillographische Blutdruckmessungen und die Deutung der Blutdruckkurve," Abderhaldens Handbuch der biologischen Arbeitsmethoden, 1931, v., 773–844.

(5) While the arteries in a normal cadaver, true to their name, are empty, Egon Plesch found that the arteries of dead arterio-sclerotics were still filled with blood, an indication that the tonicity of the arteries, as an *ultimum movens*, was not sufficient to drive the blood into the veins.

(6) At operations the small arteries in the healthy body retract and require no ligature, while in arterio-sclerotic subjects very small arteries must be ligated.

(7) In order to prove the correctness of our contentions we conducted investigations in the Pathological Institute of the Virchow Hospital, Berlin (Prof. Anders) with apparently unchanged sections of arteries from arterio-sclerotic subjects. The sections showed the usual attenuation of the walls corresponding to their atonic state.

We inserted a cannula in a small branch of the brachial artery and so filled a ligated section of the artery, about 3 to 4 cm. in length, with a 10 per cent. solution of formalin under a pressure of about 2 metres. In order to harden the artery, we surrounded it with cotton-wool packing saturated with a solution of formalin. The filled arterial section was excised 1 cm. below the ligature to enable us to obtain a longitudinal histological preparation showing both distended and unstretched sections of the artery in uninterrupted sequence. Transverse sections of the distended and undistended parts of the artery could also be examined by this procedure. A very large number of preparations were made, but I only illustrate here the most characteristic examples.

The section seen in Fig. 1A is from a healthy body. In the undistended section of the longitudinal preparation (i.e., below the ligature) the lamina elastica interna has the regular undulating lines characteristic of contracted arterial walls in death. In the section of the artery which had been placed under pressure (i.e., from above the ligature) the undulating lines are drawn out, so that the lamina elastica forms an almost straight line.

Fig. 1B shows a transverse section of a healthy artery not under pressure (magnification × 48).

Fig. 1C shows a healthy artery under pressure (magnification × 74). The differences in the lamina elastica under the varying conditions are not pronounced; only under pressure the undulations are flattened out. The entire wall in both specimens is attenuated; this fact appears when allowance is made for the difference in magnification.

In Figs. 1D and 1E are seen macroscopically unchanged sections from a very heavy sclerotic artery. In the part not subjected to pressure (Fig. 1D) the layers of the lamina elastica interna are split up, and the individual undulations are less uniform; they are also not so marked as in the healthy artery and show a knob-like thickening at various places. In the part subjected to pressure (Fig. 1E) the undulation in some parts of the lamina elastica is obliterated, in other parts the lamina elastica is ruptured. These ruptured pieces have shrunk irregularly. The difference in the thickness of the tunica media corresponds to the dilatation of the vessel, and the tunica intima of the apparently intact artery shows the proliferation generally found in arterio-sclerotic cases.

On the whole, the preparations prove that sections from even a macroscopically unchanged artery of a sclerotic subject show pathological changes, and that the disease is not local but involves the whole system.

Ætiological Proofs.

Every influence that is capable of weakening the organism to such an extent as to produce a general atony can also without hesitation be held responsible for arterial atony and for calcification. All the ætiological factors enumerated disconnectedly in the text-books can, therefore, be brought into one system and classified.

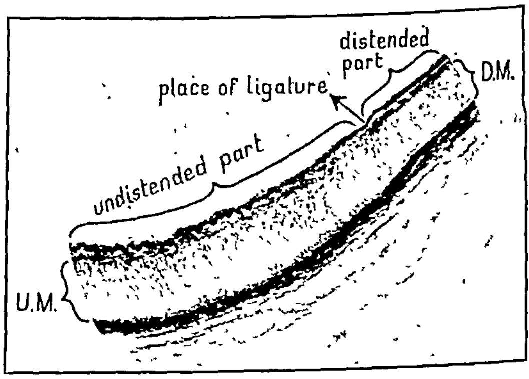
It is not my intention to enumerate every one of these ætiological moments. On close analysis they will be found to fall naturally under the simple heading of atony. Whether it is an acute or chronic infectious disease that is involved, or alimentary insults, intoxications of any description, endogenous hormonic injuries, nervous influences, alcoholic abuse or the effect of disorders of metabolism such as diabetes mellitus, gout, or obesity, it will always be found that these influences at some stage induce an atonic state, as a result of which a purely mechanical and secondary sclerosis develops in the arteries.

It is well known that arterio-sclerosis can be produced experimentally in animals by feeding them on a diet rich in cholesterol or by administering digalen, nicotine, aliphatic aldehyde, adrenalin, &c. In each of such intoxications there is a sudden excess of action that induces a state in which the tonicity of the blood-vessels is more or less seriously impaired —a state which can only with great reserve be compared with the slowly developing condition in humans. The latest idea, that spontaneous arterio-sclerosis is due to cholesteræmia, is entirely fallacious; it is probably a sequela but certainly not the cause of the calcification.

At a time when sport is so popular as to-day, I do not wish to leave it unmentioned that athletes show marked calcification by the age of 35 or 40, that they are seldom capable of great physical effort when they attain middle life, and that most of them die before they are 50. The explanation for this is quite simple; for after all heavy bodily exertions we have, by way of reaction, a severe relaxation of the blood-vessels which lasts quite a long time. The high blood pressure, meeting the arteries when in this state, produces the damage we so frequently observe in athletes.

As regards the influence of age in the ætiology of arterio-sclerosis, we must above all break away from Virchow's statement that every one has arterio-sclerosis after his fortieth year—in so far as it both expresses a threat and induces resignation. Arterio-sclerosis is not necessarily a disease peculiar to old age; it is often found in youthful people, and often absent in the aged; and when it does make its appearance in old age it rarely has any serious consequences.

FIG. 1 (A).

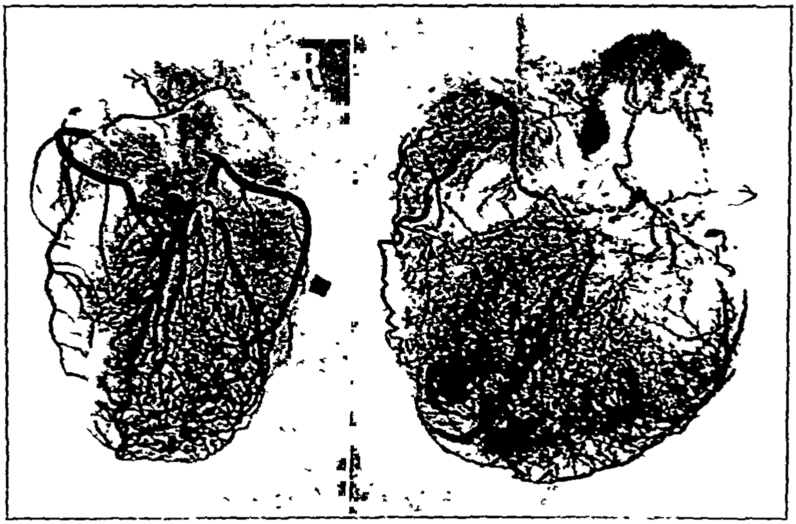


Longitudinal section of a healthy artery after application of a ligature. U.M. = undistended tunica media. D.M. = distended tunica media.

The Statistical Argument.

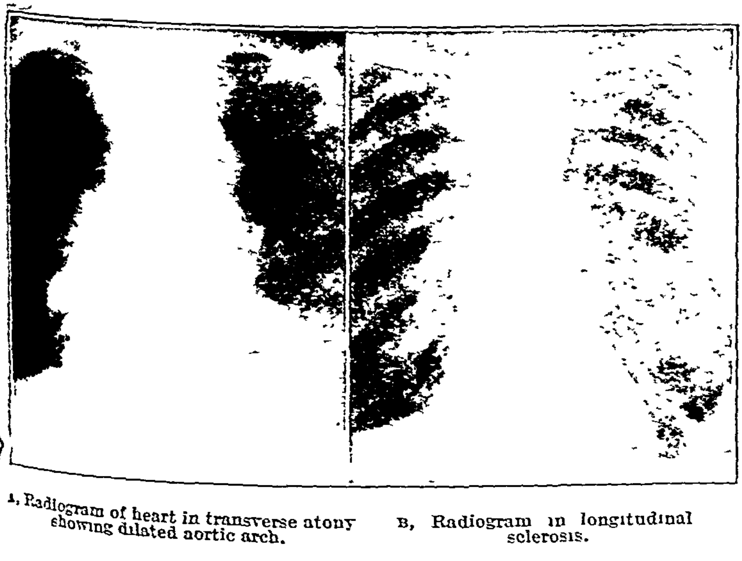
The post-mortem examination of healthy young soldiers who fell during the war revealed a surprising prevalence of arterio-sclerosis. Moenckeberg, in his very carefully prepared statistics, was able to prove that 44·5 per cent. of soldiers between the ages of 21 and 30 years and 62 per cent. of those between the ages of 31 and 40 years showed arterio-sclerotic art (Fig. 4A) the arteries have a more or less straight urse; the blood-vessels are uniformly wide and become adually narrower according to the number of branches ey send off, until finally they form a fine network of llaries with numerous anastomoses. The left ventricle is tter served with capillaries than the ght. The diameter of larger vessels comparatively small, and the walls ter resistance to the injection essure. On the other hand, in e sclerotic specimen (Fig. 4B) e arteries, in spite of the narrow conary ostium, are dilated. Besides is they show miliary aneurysmatic latations. Furthermore, the main teries, as also the arteries of the cond and third order, are lengthened d curled up like a corkscrew. The ole picture shows the arteries as un dilated vessels without resistance. tereoscopically we can see the ferences between the two preparaons still better. We will report lly elsewhere on the details obtained the above new method, which do t apply to the heart alone but also o all the other organs of the body.

FIGS. 4 (A). 4 (B).



Radiograms showing arteries of (A) normal and (B) sclerotic heart.

FIGS. 3 (A). 3 (B).



A, Radiogram of heart in transverse atony showing dilated aortic arch.

B, Radiogram in longitudinal sclerosis.

(g) *The anginal condition.*—Parallel with a change in the vascular system of the heart there must be a change in its blood-supply, which not only affects the heart's capacity for work but also leads to those sensations which, according to the extent of the change, we call either oppressive feeling or angina pectoris. I believe that this theory is applicable to all forms of anginal conditions occurring in the various organs, such as intermittent claudication and dyspragia angiosclerotica, from sclerotic dizziness to epilepsy. We assume that when an artery which has lost most of its elastic resistance is over-dilated, it reacts with a hyper-compensatory spastic contraction. Within certain limits this contraction is the only effective regulator of the velocity of the blood stream. It sets in physiologically and corresponds to the dilatation that preceded it. On the other hand a pathologically changed vascular system will respond to over-dilatation with a spasm. Attacks of angina pectoris are all produced by such spastic paroxysms. It follows, therefore, that every spasm in a vascular area must have been preceded by a dilatation. The form, size, and course of the blood-vessels as shown in our pictures (Fig. 4B) justify this assumption so far as the heart is concerned. For the other organs the proofs must still be supplied by similarly injected preparations. But, even now, according to clinical experience—particularly with intermittent claudication—there is hardly any doubt that the conditions in other organs are similar to those found by us in the coronary area.

(h) *Elevated diaphragm.*—The meteorism so frequently met with in arterio-sclerotics and the high position of the diaphragm can best be explained by an unsatisfactory blood circulation in the atonic arterioles. In the intestines there is a constant development of flatus. Normally these gases are easily absorbed by the blood and reach the lungs by way of the vena cava inferior and the pulmonary arteries, where they are soon passed off in consequence of the difference in tension between the expiratory gases and the external air. Otherwise it is not possible to explain the fœtor ex ore in fermentative dyspepsia which does not emanate direct from the lungs or upper air passages. After a garlic meal the breath smells for 24 hours and more. If the circulation in the intestines is impaired, the gases remain in the intestines and inflate them. It has not yet been determined whether this increased inflation of the intestines drives the diaphragm upwards or whether the latter is elevated by suction in consequence of the raising of the respiratory middle position in individuals with weak hearts (a change which I have already reported [2]).

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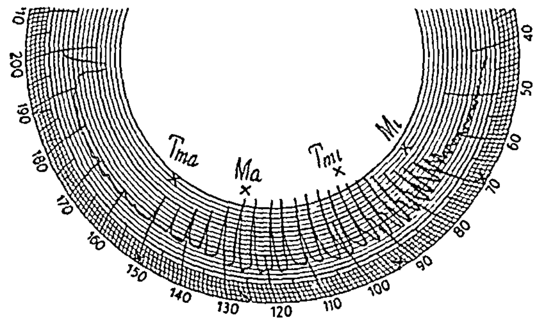
[2] Zeit. f. exp. Path. u. Ther., 1913, xiii. 1.

minimum pressure and the amplitude of the pulse be examined under varying influences (work, mechanical, thermal, and other irritations). A displacement of the values can only be caused by a rise in the maximum pressure or by a drop in the minimum pressure. The nature and the extent of the displacement are apparently of importance.

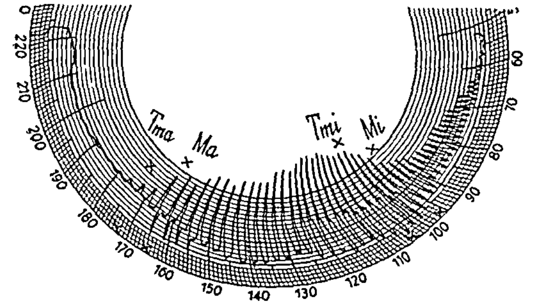
FIG. 2 (A).—*Tonoscillogram in Health.*



Total maximum pressure (Tma) = 150 mm. Hg.
Maximum pressure (Ma) = 126 ,, ,,
Total minimum pressure (Tmi) = 93 ,, ,,
Minimum pressure (Mi) = 69 ,, ,,
Opening length (Tma – Ma) = 24 ,, ,,
Compression length (Tmi – Mi) = 24 ,, ,,

(*d*) *Amount of blood.*—In the first place the blood amount serves the purpose of filling the blood channels. A dilated vascular system of necessity involves an increase in the amount of blood. The measurements I made determining the amount of blood in the system showed that in the early stages of arterio-sclerosis there is a "status plethoricus" characterised by a blood increase of up to 100 per cent. (cf. J. Plesch, *Zeit. f. klin. Med.*, 1922, xciii., 272). It is clear that in a dilated vascular system the circulation of the blood, *ceteris paribus*, must be slower. This retardation was noticed by L. Traube, and has since then been verified by more accurate methods.

FIG. 2 (B).—*Tonoscillogram of an Atonic Subject.*

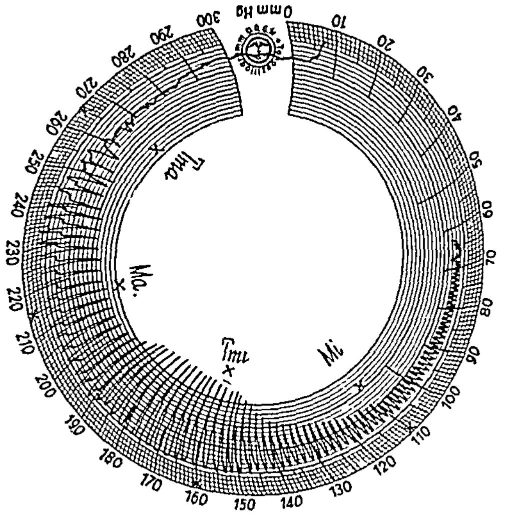


Tma = 173 mm. Hg.
Ma = 165 ,,
Tmi = 104 mm. Hg.
Mi = 96 ,, ,,
Tma–Ma = 8 mm. Hg.
Tmi–Mi = 8 mm. Hg.

(*e*) *Roentgenography.*—By means of X rays we can distinguish longitudinal and transverse atony at the aorta. In transverse atony we see the familiar picture (Fig. 3A) of the dilated aortic arch, more particularly in the ascending part of the aorta. In longitudinal sclerosis there may be a picture as shown in Fig. 3B, which up to now has received little attention. The heart is suspended from the aorta, as it were by a drawn-out elastic band, its apex burrowing deep into the diaphragm, with which its longitudinal axis forms an acute angle. It takes up a vertical position, and not a horizontal position as in transverse sclerosis. G. Holzknecht drew attention to the fact that, in cases of calcification, the left superior bend of the aorta shadow (that is, the point where the aortic arch goes over into the descending aorta) as a rule stands out more prominently as a result of the elongation of the vessel. This can be seen in Fig. 3, but on the fluorescent screen it was seen still more distinctly in consequence of the lively pulsation already observed by Holzknecht. The two types of atony can be distinguished from one another roentgenologically at a time when the vascular wall is neither thickened nor calcified.

(*f*) *Sinuous blood-vessels.*—A symptom of arterial atony that strikes the eye immediately is the sinuous temporal artery. This was always regarded as a characteristic sign of calcification, but the sinuous temporal artery is usually soft and has delicate walls. The winding course of the artery is due to the fact that it is held in a fixed position at a number of points by connective tissue, and that when the tonus of the elements working in the longitudinal direction relaxes, the artery becomes longer and then curls between the points of fixation under the influence of the blood stream.

FIG. 2 (C).—*Tonoscillogram of an Arterio-Sclerotic Subject.*



Tma = 265 mm. Hg.
Ma = 215 ,, ,,
Tmi = 160 mm. Hg.
Mi = 110 ,, ,,
Tma–Ma = 50 mm. Hg.
Tmi–Mi = 50 mm. Hg.

We are not splitting hairs when we make a diagnostic distinction between longitudinal and transverse atony, because this separation is of prognostic value. As a rule it can be said that the longitudinal atony is prognostically more favourable than the transverse. Moenckeberg was the first to draw attention to the fact that individuals with sinuous temporal arteries live longer than arterio-sclerotic subjects that have no such winding arteries. This was confirmed by Wenckebach.

Hearts with severe sclerosis and without sclerosis were, according to a technique of my own, filled with mercury through the coronary artery. The preparations so obtained in the Pathological Institute (Prof. Anders) and the Roentgen Institute (Dr. Bucky) of the Rudolf Virchow Hospital by my co-worker Dr. Egon Plesch were afterwards stereoscopically radiographed. Of the large number of photographs taken only two will be reproduced here. In the normal ing, but rather to direct it. In this way a good deal can be done to bring down excessive blood pressure to the individual level. Further than this, no direct measures should be undertaken against hypertonia. The medicaments for reducing blood pressure act by paralysing the blood-vessels and are, therefore, therapeutically absurd, because they are more inclined to help the further development of arterio-sclerosis than to prevent it. It is therefore intelligible why those remedies that produce experimental arterio-sclerosis are most effective in reducing blood pressure. When they are used, the blood pressure does well but the patient is ill. Still less rational are remedies given to "loosen the lime in the arteries." Only in the height of folly can the idea be conceived to free the body from its protecting armaments.

(b) *Reduction in the amount of blood.*—The necessary increase in the blood volume is also frequently exceeded, so that we are compelled to reduce the amount artificially. Blood-letting has most certainly celebrated its highest triumphs in the presclerotic plethora—i.e., arterial atony—and to-day it is still our most heroic remedy for this condition. If there is any objection to it, it is the brutal way in which the quantity of the blood is suddenly reduced. The atonic arteries are compelled to adapt themselves accordingly, but not without a considerable disturbance of the circulation and the exchange of body fluids. Of course, there are urgent cases in which we cannot avoid this evil, but it is more advisable to reduce the blood volume by means of a diet poor in nitrogen and salt.

We have been able to prove in a series of investigations[3] that it is possible to reduce the blood-volume far more effectively by dieting and fresh air, not only in healthy individuals and also in arterio-sclerotic subjects (vide Table). In the first few days diuresis sets in and subjective discomfort is reduced: the heart becomes quieter, the breathing freer, the head clearer, &c. If it is desired to stabilise these effects, the course must be continued for four to six weeks. A valuable adjuvant to the treatment is arsenic; I employ the old well-tried Fowler's solution. Only when arsenic is not tolerated do I give the usual phosphorus preparations.

It is practicable to repeat the nitrogen- and salt-free diet[4] every year for three to four weeks and also to introduce a "dietetic day" once a week to relieve the vascular system. This scheme has a great resemblance to certain ritual measures recommended by founders of religions (Lent, Ramadan, half and whole days of fasting, &c.), and it could therefore well be described as a Biblical diet. It has proved of value through thousands of years and requires no special recommendation. The task of medical investigation is not continually to discover this diet anew but to retain it in its original form, to set up indications for its employment and, last but not least, to investigate why it is most effective in spring. Every new adaptation of the body, whether in consequence of dietetic, physical, hygienic, or any other measures, is only of use if induced periodically. To stabilise a nitrogen- and salt-free diet simply because it has rendered good service after six weeks would be fraught with great danger and must on all accounts be avoided. It goes without saying that better results are obtainable with the dietetic fresh-air treatment if the patient has absolute mental relaxation and psychic rest.

If we had the courage to break away from pocket-book prescriptions, we should manage, in the large majority of cases, without cardiac tonics. The idea of "digitalis at all costs" is objectionable. The prolonged administration of small doses of iodide of potassium is injurious rather than useful. On the other hand, where arterio-capillary fibrosis has already developed, iodide of potassium in large doses up to 8·0 g. daily for ten days, without regard to minor complaints of iodism, is recommended. The treatment should be repeated two or three times at intervals of ten days. At the end of the dietetic fresh-air course moderate exercise and gymnastics may be allowed. Over-exertion in sport must be firmly vetoed. Cold water treatment, baths, drinking cures, and such like are subject to special indications; it would be impracticable to enumerate them all.

The symptomatic treatment is a matter of choice. Only for meteorism, as it is not so well known, I would like in conclusion to recommend tincture of asafœtida, about 15 drops in gelodurat capsules before meals.

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[3] Zeit. f. klin. Med., 1922, xciii., 241.
[4] Ibid., p. 253.

DIAGNOSIS OF AMYLOID DISEASE
BY THE INTRAVENOUS INJECTION OF CONGO-RED.

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UNTIL recent years the diagnosis of amyloid disease rested entirely on the physical findings of enlargement of the liver and spleen, together with the appearance of albuminuria in cases of prolonged suppuration. In 1923–24 Bennhold, who for 20 years had been using Congo-red as a stain for sections of amyloid tissue, discovered that the intravenous injection of this dye would disclose the presence of amyloid during life.[1] Since then the test has been investigated and the technique modified by Strasser[2] and Nathan[3] on the continent, and by Bookman and Rosenthal[4] in America, but I know of no English work on the subject.

An institution such as the Liverpool Open-air Hospital for Children, Leasowe, where there are many cases of chronic and severe suppuration, mostly tuberculous in origin, offered an excellent opportunity for a study of the test. The following is an account of the investigation undertaken.

The rationale of the work depends on the essential fact that amyloid material adsorbs Congo-red. An intravenous injection of an aqueous solution of this dye is made, and the percentage decrease of the dye-content of the plasma (or serum) over a period of one hour is estimated colorimetrically. In the normal person an amount of 10–30 per cent. is found to have disappeared. In cases of amyloid disease there is a decided increase in the rapidity with which the dye leaves the blood, and a diminution at the end of one hour of anything between 30 and 100 per cent. may be recorded.

Keith, Rowntree, and Geraghty,[5] working with Congo-red in the determination of blood volume, found that, on injection into the blood stream, it became homogeneously distributed in the plasma in four minutes and began to disappear in ten minutes. Normally all the dye had left the blood at the end of 24 hours. Smith[6] states that in normal dogs it is slowly taken up by phagocytes in various parts of the body, and that there is also a slow excretion by the liver into the bile.

Pressure from below and suction in this case work in the same direction; furthermore, these forces are here acting on an atonic diaphragm. In any case it is physiologically easier to assume that an atonic diaphragm is elevated by suction from the negative intrathoracic pressure of Donders rather than that it is raised from below by the positive abdominal pressure. The latter pressure could only be maintained by a constant tonic contraction of the abdominal walls. As a rule the intestinal gases are under minimal positive pressure (the flatus can only be expressed by a powerful contraction of both the abdominal muscles and the diaphragm!). So long as the abdominal muscles give way to the inflation pressure, the positive abdominal pressure will hardly act on the diaphragm. Moreover, if it is the intra-abdominal pressure that raises the diaphragm, the diaphragm must subside and take up its normal position again when, in the living or the dead, the abdomen is opened. In fact, however, it retains its raised position after the abdominal cavity has been opened, which proves that it is not forced upwards by the abdomen but is held up by suction.

Case No.	Weight of body in kg.	Age.	Blood pressure in mm. Hg.		Hæmoglobin.		Total hæmoglobin.		Amount of blood.		Remarks.
			Max.	Min.	O₂ Cap. in Vol. per cent.	In g. per 100 blood.	In g.	Per cent. body-weight.	In kg.	Per cent. body-weight.	
1A	77·0	57	250	190	16·0	11·9	692	0·89	5787	*7·5*	Arterio-sclerosis, angina pectoris, No œdema. Albumin positive.
1B	74·5	—	200	165	18·5	13·8	614	0·82	4560	*5·8*	Same patient after 10 days' NaCl and N-free diet.
2A	77·0	63	170	120	17·8	13·3	625	0·81	4705	*6·1*	Arterio-sclerosis, angina pectoris, intermittent claudication.
2B	75·5	—	135	100	18·5	13·8	568	0·76	4136	*5·3*	Same patient after 8 days' NaCl and N-free diet.
3A	64·0	58	134	88	11·8	8·8	675	1·53	7070	*11·0*	Arterio-sclerosis. Myodegen. cordis. Heavy œdema.
3B	55·0	—	145	100	16·2	12·1	845	1·54	5233	*9·5*	Same patient after 5 days' NaCl and N-free diet. Total diuresis in 5 days 141.
4A	58·0	61	202	85	7·0	5·7	241	0·41	4230	*7·3*	Arterio-sclerosis with coronary sclerosis and aortic insuff. No albumin. Chronic bronchitis.
4B	57·0	—	117	85	9·0	6·7	222	0·39	3310	*5 8*	Same patient examined on 9th day of NaCl and N-free diet.
5A	64·0	55	224	94	15·3	11·2	586	0·91	5235	*8·2*	Arterio-sclerosis, aortic and mitr. insuff., chron. bronch. with emphysema.
5B	62·5	—	161	62	16·0	11·9	518	0·83	4360	*7·0*	Same patient examined on 8th day of NaCl and N-free diet.
6A	54 0	63	160	91	19·4	14·5	502	0·93	3450	*6·4*	Arterio-sclerosis, senile tuberculosis, chron. bronchitis.
6B	54·0	—	131	68	16·0	12·0	448	0·83	3135	*5·8*	Same patient examined on 10th day of NaCl and N-free diet.
7A	68·0	43	153	87	16·2	12·1	656	0·96	5425	*8·0*	Arterio-sclerosis, chron bronchitis, emphysema.
7B	65·0	—	133	71	18·0	13·4	644	0·99	4810	*7·4*	Same patient examined on 10th day of NaCl and N-free diet.

The conditions are therefore analogous to those obtaining in paresis or paralysis of the diaphragm. The primary cause of presclerotic meteorism is not an increased generation of gas but a reduced escape of gas. This distinction is important because of its far-reaching therapeutic consequences. Meteorism is analogous to the feeling of oppression in the heart and numbness in the legs, whilst Ortner's disease, as a paroxysm of spastic contraction of the intestinal blood-vessels, is analogous to angina pectoris and intermittent claudication. If I wished to bring these diseases unconstrainedly under the same heading, I would regard their common cause as a spasm induced by way of reaction after an over-dilatation of the corresponding atonic vascular section. In this way I dispense with the hypothesis hitherto relied on: that every paroxysm is due to an increased nervous irritability.

Therapy.

The prophylaxis and treatment of atony in its early stages consist chiefly in removing as far as possible the injurious ætiological elements. In addition, the following procedures are recommended.

(*a*) *Regulation of blood pressure.*—First of all the over-taxed circulation must be relieved. When the patient lies down the circulatory forces need only act in the horizontal direction. The exclusion of the hydrostatic pressure factor leaves only the dynamic and hydraulic pressure factor involved and immediately relieves the heart to an enormous extent. This relief is very often in itself enough to reduce the blood pressure sufficiently. A treatment for arterio-sclerosis that is not undertaken in the horizontal position must, to say the least, be regarded as impracticable, and cannot be recommended.

Superfluous as the reminder may seem, it must nevertheless be repeated and strongly emphasised that hypertonia is only a symptom and not the disease itself. Just as we no longer believe that in combating fever we are also fighting an infection, so also we may not imagine that in combating hypertonia we are doing something to relieve the arterio-sclerosis. It is of the utmost therapeutic importance, and it cannot be sufficiently emphasised, that it is only the increased blood pressure that enables us under the altered circulatory conditions to save life at all. The physician who is determined to reduce the blood pressure by force, without first combating the causes responsible for the high blood pressure, commits malpractice. The body compensates suitably in the necessary direction, but the compensation usually overshoots the mark. The most important thing, therefore, for the physician to do is not to work against compensasometimes persisted for as long as four weeks. (3) Hæmolysis and clotting spoiled a few tests. Blood containing Congo-red showed a tendency to clot rapidly. This was overcome by rinsing the tubes and syringes with citrate solution prior to withdrawal. Becker[10] has noted this effect on coagulation time, and considers that Congo-red may be of definite value as a hæmostatic. (4) Difficulty was sometimes experienced in obtaining a perfect match in the colorimeter, especially in cases of about 50 per cent. decrease. This was obviated by (*a*) reducing the stronger plasma to a known dilution with distilled water, or (*b*) adding to each plasma two drops of concentrated hydrochloric acid. This latter gave a blue coloration to each plasma which was more suitable for matching. Three readings were usually made at different settings of the standard and the average worked out. (5) In the cases recorded in Table I. as 100 per cent. decrease, Plasma II. had the straw-coloured appearance of normal plasma and the colorimeter was not used.

RESULTS.

Table I. shows that of 17 cases clinically suspected of amyloid disease, the diagnosis was confirmed by the test in 15. Six of these cases (Cases 3, 7, 9, 10, 18, and 22) were only suspected by reason of albuminuria, but the test revealed the presence of amyloidosis in the first four and its absence in Cases 18 and 22. In 12 advanced cases of chronic suppuration with no clinical manifestations of amyloid disease, the results of the test were within normal limits, as they were also in the seven cases of early surgical tuberculosis used as controls (Table II.). The three following cases of enlarged spleen of non-amyloid origin gave normal results, thus failing to confirm Strasser's observation that these cases introduce a fallacy into the test.

CASE 36.—Age 24. Spleno-medullary leukæmia. Liver normal. Spleen below umbilicus. Congo-red decrease 15 per cent. Faint trace in urine.

CASE 37.—Age 10. ? Congenital syphilis. Liver and spleen each 2 in. Congo-red decrease 28 per cent. Nil in urine.

CASE 38.—Age 10. Splenic anæmia. Spleen 3 in. Liver normal. Congo-red decrease 8 per cent. Nil in urine.

Case 39 (chronic parenchymatous nephritis) confirmed in a striking way Bennhold's statement that in this condition the dye rapidly leaves the blood via the kidneys.

CASE 39.—Age 27. Chronic parenchymatous nephritis. Non-protein nitrogen 28 mg. per cent. Blood pressure 115. Albumin 2 per cent. Granular and hyaline casts. Deficient urea concentration. Urine 27 oz. per day. Œdema and ascites. Congo-red decrease 80 per cent. Large amounts of dye present in urine 15 and 45 minutes after injection.

Further research on these lines regarding the differential diagnosis of the various types of nephritis should prove of considerable value. The test does not decide whether, in Case 39, amyloid disease was present in addition to the renal condition. The absence of dye (in any quantity) in the urines of the amyloid cases may be explained by (1) the rapid removal of dye by the amyloid material, and (2) the fact that the damage to the amyloid kidney, at any rate until the disease is well advanced, is glomerular rather than tubular. In two of the amyloid cases the results obtained by the Congo-red test were confirmed by post-mortem examination.

POST-MORTEM FINDINGS.

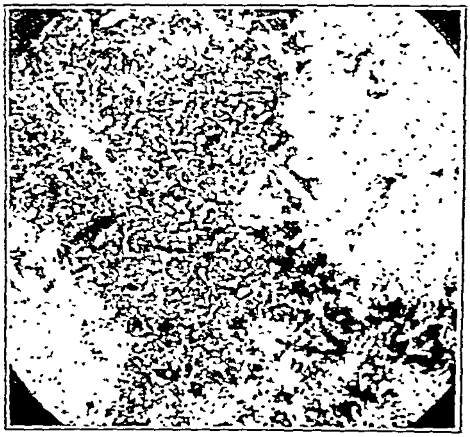
Post-mortem examinations were done on Cases 8 and 14.

CASE 8.—Autopsy two months after dye test. No macroscopic staining of organs. Advanced amyloid disease of liver, spleen, kidneys, and small intestine.

CASE 14.—Autopsy one week after dye test. Advanced amyloid disease of liver, spleen, kidneys, small and large intestines, suprarenal, and pancreas. Liver, spleen, and kidneys definitely stained red by the dye. It was found impossible to demonstrate the presence of Congo-red in the amyloid tissue on section, even after acidifying.

Congo-red as a Stain for Amyloid.—A paraffin section of the liver of Case 14 was stained by Congo-red (Fig. 2), using Bennhold's technique.[11] (Stain 15–30 minutes in 1 per cent. Congo-red. Place in lithium carbonate 15 seconds. Differentiate with 80 per cent. alcohol. Counterstain with hæmatoxylin.)

FIG. 2.



Section of liver showing (dark) areas of amyloid tissue stained by Congo-red. Normal liver cells (pale) counterstained with hæmatoxylin.

Waldensröm[12] has described a diagnostic method in which material for microscopic examination is obtained by puncture of the liver with a large-bore needle. The Congo-red method possesses the obvious advantages that it gives a quantitative result and that it is also somewhat less drastic.

Clinical observations on the above cases show that, in a certain number, healing of the tuberculous condition is followed by involution of the amyloid disease, ultimately leading to complete recovery. This view is supported by Sir Robert Jones (personal communication), Waldensröm, and Walker.[13] It is therefore of prognostic value to detect its presence and to follow its course. The use of Congo-red provides a comparatively accurate means of so doing, and the claims of this dye to a place in the clinical or pathological consideration of amyloid disease cannot therefore be disregarded.

I am indebted to Dr. T. Hartley Martin, the senior medical officer, for his kindness in facilitating the work at the Leasowe Hospital, and to Prof. J. H. Dible for his advice and assistance. My thanks are also due to Prof. John Hay and Drs. Capon, Cunningham, and Wallace Jones for permitting me to have access to various cases.

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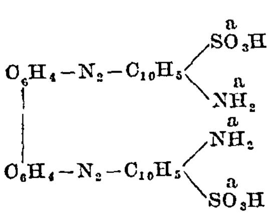
In severe cases of amyloid disease Bennhold found that the dye had often left the blood completely at the end of one hour. In only one other condition did he find a corresponding rapidity of disappearance—namely, in pure tubular or parenchymatous nephritis (four cases). Here the dye quickly left the blood via the kidneys and was found in large quantities in the urine, whereas in the normal only a trace appears in this way. In glomerular nephritis and nephrosclerosis (15 cases) he found normal values. Strasser has confirmed these findings and, in addition, points out that occasionally in cases of splenic tumour of non-amyloid origin the dye leaves the blood at a faster rate than the normal.

CHEMISTRY.

According to Mann,[7] Congo-red results from the action of tetrazo-diphenyl on naphthionic acid and has the following formula, containing two amido and two sulphonic acid groups. The red colour is changed to blue on the addition of weak acids.



The chemical nature of amyloid material is still doubtful. The old theory that it *consists of chondroitin-sulphuric acid* in combination with protein has been criticised by Eppinger and others who, on analysing masses of pure amyloid deposit, found no sulphur, phosphorus, or carbohydrate.[8] Karczag [9] states that the specific staining of amyloid depends on its strongly electro-negative charge as compared with collagen. Hyaline has a still weaker negative charge. In tissue degeneration generally the tendency is to a lowering of the charge; therefore amyloid must come from substances of strong negative character and hyaline from collagen or elastic tissue.

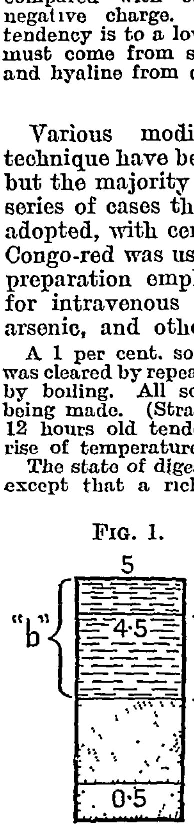
TECHNIQUE.

Various modifications of Bennhold's original technique have been made, some workers using serum, but the majority preferring plasma. For the present series of cases the method described by Strasser was adopted, with certain minor modifications. Grubler's Congo-red was used throughout, since the commercial preparation employed in chemical work is unfitted for intravenous injection by the presence of lead, arsenic, and other impurities.

A 1 per cent. solution of the dye in hot distilled water was cleared by repeated filtration through paper and sterilised by boiling. All solutions were used within 12 hours of being made. (Strasser observed that solutions more than 12 hours old tended to produce shivering attacks and a rise of temperature.)

The state of digestion in relation to the test is immaterial except that a rich fatty meal shortly before is contraindicated. The patient having passed urine, the dye was injected into a basilic vein in amounts of 0·25 c.cm. per kg. of body-weight. (The quantity for the children in the present series ranged from 6–12 c.cm.) Four minutes after injection 5 c.cm. of blood were withdrawn, preferably from another vein, and one hour after injection a second 5 c.cm. sample was taken. Specimens of urine were obtained 15 minutes and 45 minutes after injection.

FIG. 1.



Each blood sample was immediately transferred to a small flat-bottomed tube graduated at 0·5, 4·5, and 5 c.cm., which had previously been filled to the 0·5 c.cm. mark with 3·8 per cent. sodium citrate solution. The tube was filled to the 5 c.cm. mark with blood, which was then mixed with the citrate by very gentle rotation. The two tubes were then centrifuged together at 2000 revolutions for 15 minutes, by which time the corpuscular element was entirely precipitated. Two measurements (in millimetres) were then made on each tube (see Fig. 1). The height "a" from the top of the corpuscular layer to the 4·5 c.cm. mark represents the height of the plasma alone. The height "b" from the top of the corpuscular layer to the 5 c.cm mark *is that of the plasma* plus the 0 5 c.cm. of citrat originally added. This factor b/a was used in the calculatio (see below) to correct any variation in the proportion o liquid to corpuscular elements of the blood, as this pro portion is not necessarily the same in each case. The tw samples of plasma were then pipetted off and compared a Duboscq colorimeter, using Plasma I. as the standar The following illustrates the calculation in a normal case.—

		Plasma I.		Plasma II.
Colorimeter reading	..	7 0	......	8 7
b/a factor	..	22/18	......	19/16

Calculation:—

Plasma I. = 7·0 × 22/18 = 8 55
Plasma II. = 8·7 × 19/16 = 10·33

Then, if Plasma I. (the standard) be equivalent to 1 per cent., Plasma II. $= \frac{8\cdot55}{10\ 33} \times 100 = 83$ per cent.—i e., decrease of 17 per cent.

TABLE I.—*Advanced cases of surgical tuberculosis wi chronic sinus formation. Ages 7–18 years. Regio affected: hip, spine, and knee.*

Case.	Duration of disease in years.	Percentage decrease. Congo-red. Normal 10–30.	Amyloid clinically.	Notes.*
1	6	100	Yes.	L. 6; S. 4; alb. + +.
2	13	100	„	L. 2; alb., trace; recovering
3	2	38	?	Alb. +.
4	5	100	Yes.	L. 5; S. 2; alb. + +.
5	6	100	„	L. 5; S. 3; alb. + +.
6	5	46	„	L. 2; S. 1; alb. + +.
7	6	60	?	S. ?; recovering.
8	4	100	Yes.	L. 4; S. 2; alb. + +; died.
9	10	56	?	No physical signs now.
10	7	55	?	No physical signs.
11	8	100	Yes.	L. 6; S. 3; alb. + +.
11*a*	8	100	„	Conf. test 3 months later
12	5	55	„	L. ½; alb., occasionally.
13	11	100	„	L. 2; alb. + +.
14	6	100	„	L. 4; S. 3; alb. + +; died.
15	4	100	„	L. 3; S. 2; alb. + +; died.
16	5	23	No.	—
17	5	22	„	Occasional albumin.
18	4	26	?	„ „
19	5	5	No.	—
20	6	8	„	—
21	3	18	„	—
22	4	22	?	Occasional albumin.
23	4	20	No.	—
24	7	19	„	—
25	15	25	„	—
26	4	6	„	—
27	5	10	„	—
28	3	28	„	—

* L. = liver; S. = spleen; conf. = confirmatory; figures = in below costal margin.

None of the above had more than the faintest ma scopic trace of dye in the urine.

TABLE II.—*Control cases of early surgical tubercul without sinus formation.*

Case.	Site of disease.	Percentage decre Congo-red.
29	Adenitis.	28
30	„	24
31	„	11
32	„	12
33	Peritonitis.	30
34	Lupus.	28
35	Hip-joint.	21

Only a *faint trace of dye* appeared in the urines.

The following personal observations on techni were made: (1) No ill-effects were seen either du or after the test. The dye was injected as rapi as the vein would take it. (2) Owing to the us difficulties with children, slight paravenous injecti were occasionally made accidentally. These w followed next day by a bright red imbibition of surrounding skin, which was quite painless, but wh may tend to be generally richer in A than the rest of England.

These findings seem quite inconsistent with the theories of Langdon Down and Crookshank. Moreover, an hypothesis was put forward by Crookshank[2] that Mongolian imbeciles were related in some way to orang-utan monkeys. As far as the blood groupings are concerned. this hypothesis finds no justification. Of the six orangs classified by Landsteiner and Miller,[8] two belonged to Group II., three to Group III., and one to Group IV. To these numbers can be added the results of two orangs tested by me: one of these was Group III. and the other Group IV. It is clear, however from such small numbers. that these monkeys, unlike the Mongolian imbeciles, show a high incidence of the character B.

To summarise, then, the distribution of the four blood groups (which is characteristic for different races) has been studied in 166 Mongolian imbeciles. The results do not support the hypothesis that this class of imbeciles has any relationship to the Mongolian race.

I am much indebted to the medical superintendents of Darenth Training Colony, the Fountain Mental Hospital, Leavesden Mental Hospital, the Mutual Sanatorium, the Manor, and the Royal Eastern Counties Institution for their permission to carry out tests on the patients at these institutions, and to the Medical Research Council and the Darwin Trust for financial assistance.

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CLINICAL AND LABORATORY NOTES

NEW ANTIMONY PREPARATIONS IN THE TREATMENT OF MEDITERRANEAN LEISHMANIASIS AND JAPANESE (OR EASTERN) SCHISTOSOMIASIS.

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THE cases described below, one of Mediterranean leishmaniasis. the other of Japanese schistosomiasis, are recorded for two reasons; firstly, their rarity in this country makes them of interest. and secondly they illustrate the use of new antimony compounds in their treatment.

MEDITERRANEAN LEISHMANIASIS (KALA-AZAR).

A girl, aged 3½ years, was admitted to the Hospital for Tropical Diseases, London, on Sept. 24th, 1931.

Previous history.—Born in England. she was taken at the age of 4½ months to Malta where she lived for three years, then returning to England. She had never had measles, scarlet fever, or other ailments of childhood.

Present illness.—Towards the end of her time in Malta the mother noticed that the child was getting pale, was running an irregular temperature, was losing some weight, and was not making proper progress; so on arrival in England she was brought to the Hospital for Tropical Diseases.

Examination.—On general inspection the patient was noted to be very pale, was listless, looked ill and was very irritable, crying on the least provocation. The heart. lungs, and central nervous system did not show any abnormality. The abdomen was pot-bellied in appearance with protuberance of the umbilicus. The spleen was enlarged, the lower edge reaching the level of the umbilicus. It was firm in consistency and slightly tender. The lower edge of the liver was palpable, two fingers-breadth below the right costal margin and dullness extended upwards to the level of the fifth interspace in the right nipple line. There was no evidence of ascites.

Diagnosis.—On clinical grounds a provisional diagnosis of kala-azar was made, this being supported by the blood picture, which showed an anæmia, accompanied by a leucopenia. Confirmation was finally obtained by liver puncture, Leishman-Donovan bodies being found in the fluid obtained.

Treatment.—In view of the child's size and the difficulty of entering a vein repeatedly, it was decided to use von Heyden 471 (Stibosan) intramuscularly. An injection of 0·025 g. was given and as this caused no untoward results the amount was raised to 0·05 g. and then to 0·075 g., the injections being given on alternate days. By the time a total of 0·625 g. had been given. the temperature had begun to fall slightly. and there was a small but definite improvement in the child's condition. Progress, however. was not as satisfactory as one would wish, so a more potent compound—namely, Neo-stibosan—was tried and this was given intravenously. a method which proved easier than had been anticipated.

The improvement was rapid and striking. Within a fortnight after starting the intravenous neo-stibosan the temperature was normal, and with the exception of the enlarged spleen. the child seemed to be rapidly regaining good health. The spleen did not begin to decrease in size until about a week after the injections had ceased; it then became steadily smaller, but was still palpable on discharge, two and a half months after admission. The liver began to decrease in size at about the same time and was normal on discharge. The amount of neo-stibosan given intravenously was 0·075 g. per dose, at first given on alternate days but later with intervals of two days. 0·800 g. in toto being administered.

TABLE I.—*Dosage.*

Day of treatment.	Von Heyden 471 intramuscularly.	Remarks.
1	0·025 g.	—
3	0·05	Temperature 103° F.
5	0·05	—
7	0·05	Child very ill.
9	0 05	Blood: R., 3,240,000; W., 3600; Hb. 45 per cent.
11	0·05	—
13	0·05	—
15	0·075	—
17	0·075	—
19	0·075	—
21	0·075	Improvement, but still temperatures up to 100·2°.
Total ..	0·625 g.	
—	Neo-stibosan intramuscularly.	—
23	0·075 g.	—
25	0 075 intravenously.	Marked difference noted in condition. Symptoms much improved.
27	0 05 g.	—
29	0·075	—
31	0·075	—
33	0·075	—
36	0·075	Temperature normal.
39	0·075	—
42	0·075	—
45	0·075	—
48	0·075	Child practically well. Blood: R., 4,020,000; W., 10,000; Hb., 60 per cent.
Total ..	0·800 g.	

THE BLOOD GROUPING OF MONGOLIAN IMBECILES.

BY L. S. PENROSE, M.D. CAMB.,
RESEARCH MEDICAL OFFICER, ROYAL EASTERN COUNTIES INSTITUTION, COLCHESTER.

A NUMBER of different theories have been advanced to account for the occurrence of the condition known as "Mongolian imbecility." When Langdon Down [1] first described and named these cases he observed a resemblance between them and members of the Mongolian race. He further suggested that the likeness might be due to admixture of Mongolian blood among Europeans. Crookshank [2] has endeavoured to follow up this idea, supporting his contention by bringing forward many resemblances or "homologies" which he believes are common to racial Mongolians and this class of imbecile.

Owing to Landsteiner's discovery of the four blood groups, and the subsequent finding that the distribution of the four groups was fairly constant among individuals of the same race, but that it differed when groups of individuals from different races were taken, a simple test can be applied to the theories of Langdon Down and Crookshank. Quite distinct differences have been observed between Europeans and Chinese, for instance, in regard to the distribution of the blood groups, and an intermediate race, like the Russians, shows an intermediate distribution. Hence, if it could be demonstrated that English Mongolian imbeciles showed an affinity to the Mongolian races in blood group distribution, this would be very favourable to Langdon Down's hypothesis.

In order to investigate this point, 166 imbeciles from institutions in London and the eastern counties were tested. All were diagnosed as being of the Mongolian type, by common consent of the medical officers in charge of them. The grouping was carried out on these cases in the following way. A few drops of the patient's blood were taken into 1 c.cm. of normal saline containing 1 per cent. sodium citrate. Two drops of the suspension so obtained were then tested on a slide with drops of serum of Group II. and Group III. respectively. The serum was supplied by Parke, Davis and Co., from St. Mary's Hospital inoculation department. In cases where there was any doubt about the agglutination the experiment was repeated.

The following figures were obtained :—

Number of Mongolian Imbeciles of English Nationality Belonging to Each Blood Group.

I.	II.	III.	IV.	(Jansky)	Total.
65 ..	78 ..	12 ..	3 ..	..	158

In addition to these there were eight Jewish cases, of which one belonged to Group I., five to Group II., two to Group III., and none to Group IV. The question of the correct interpretation of these figures now arises.

In order to account for the proportional distribution of the various groups, Bernstein [3] advanced the theory that two agglutinogens (A and B) were inherited as dominant mendelian characters (allelomorphs), and they were both dominant to the same recessive character. His theory has met with general acceptance.[4 5] The frequencies of the two characters A and B—i.e., the probabilities of their occurrence—can be directly obtained from the distribution of the blood groups thus :

$$\text{Frequency of } A = 1 - \sqrt{(\text{I.})+(\text{III.})}$$
$$\text{Frequency of } B = 1 - \sqrt{(\text{I.})+(\text{II.})}$$

where (I.), (II.), (III.), &c., are the frequencies of the blood groups in the population studied. The frequencies of A and B are very convenient for classification of the blood groups of different races. The incidence of the character B is high in Mongolian races as compared with the incidence of A, whereas in European countries the reverse is true, A being much more common than B. Unfortunately there are no large figures available for the distribution of the blood groups among the general population of London and the eastern counties to act as a standard with which to compare the group of Mongolian imbeciles A control series of 225 non-Mongolian mental defec tives from the Royal Eastern Counties Institutio tested by the same method, however, gave th following distribution :—

Number of Control Cases Belonging to Each Blood Grou

I.	II.	III.	IV.	(Jansky)	Total.
96 ..	107 ..	15 ..	8 ..	..	226

The next table shows a number of examples of tl distribution of blood groups in different populatio for comparison with the writer's figures. They a taken from Snyder,[4] and in each case the values the frequencies of A and B have been calculated.

Distribution of Blood Groups in Different Populatio

Race and investigator.	No.	Percentage of of persons in each group.				Percent frequen of the t charact	
		I.	II.	III.	IV.	A.	
English (Mongolian imbeciles) .. .. .. (Present author.)	158	41·1	49·4	7·6	1·9	30·2	
English (non-Mongolian mental defectives) .. (Present author.)	225	42·5	47·3	6·6	3·5	29·9	
English (soldiers) .. (Hirschfeld, 1919.)	500	46·4	43·4	7·2	3·0	26·8	
Norwegians .. .. (Jewell.)	436	35·6	49·8	10·3	4·3	32·3	
Russians .. .. .. (Hirschfeld.)	1000	40·7	31·2	21·8	6·3	21·0	1
North Chinese (Pekin) .. (Lui and Wang, 1920.)	1000	30·7	25·1	34·2	10·0	19·5	2
Manchus .. .. .. (Fukamachi, 1923.)	199	26·6	26·6	38·2	8·5	19·5	2
North American Indians (pure stock) .. .. (Snyder.)	453	91·3	7·7	1·0	0·0	4·0	

It will be seen by noticing the frequencies of and B in the populations referred to in the Ta that the English Mongolian imbeciles resemble v closely the control group of English non-Mongol defectives. There is no indication here that Mongolian imbeciles are the result of crossing English with any Mongolian race, for among th the incidence of the character B is low, as in other groups of English people. The figures Jewish cases are too small to argue from, but neit do they suggest any admixture of Mongolian blo In fact, what peculiarity there is in the blood group of the imbeciles points in the opposite direction. compared with Hirschfeld's figures,[7] the proporti of A is rather high, and this appears in an excess Group II. over Group I. But a high incidence of is not uncommon in the nordic races—e.g., Scan navians—and the population of the eastern count

MEDICAL SOCIETIES

ROYAL SOCIETY OF MEDICINE.

SECTION OF THERAPEUTICS AND PHARMACOLOGY.

At a meeting of this section held on Feb. 9th, the President, Dr. E. P. Poulton, being in the chair, Dr. E. C. Warner read a paper (by himself and Dr. A. C. Hampson) on investigation and treatment of certain cases of

Disease of Muscle and Nerve.

Some of the diseases investigated were, he said, self-limited—i.e., if left untreated the patient would recover. Others over which the preliminary research extended were, however, in quite a different category, such as progressive muscular atrophy, the trend of which was always downhill. As no hopeful line of treatment was known for this kind of case, any line which seemed to afford hope was worth careful study. Some of the conditions showed a deficiency of calcium and an excess of phosphorus in the cerebro-spinal fluid. It was not their view that those diseases were solely due to calcium deficiency, they were rather regarded from the standpoint of soil and seed.

In *chorea* there was found to be a slight diminution of blood-calcium, while in the cerebro-spinal fluid there was a 13 per cent. diminution of calcium in comparison with the figure after recovery. The C.-S.F. determination was of value in that it showed the concentration of active inorganic calcium, which might vary independently of the total serum calcium. It also indicated the degree of concentration of calcium salts bathing nerve-cells and fibres. Corresponding with the low cerebro-spinal fluid calcium values in chorea there was found to be a raised phosphate value. Preliminary results indicated that this might be due to a raised blood phosphatase. The total calcium content of the blood was not necessarily the measure of the active calcium in it; 50 per cent. of the total calcium was present in an inactive form, it could not pass through a capillary membrane nor through an artificial one. The other 50 per cent. was diffusible calcium, able to pass through a membrane; this was the only portion capable of ionisation. Important was the diffusible or ionic portion.

Probably the cerebro-spinal fluid phosphate was a measure of the active blood phosphate. A lowered calcium figure rendered the cell membrane more permeable and more liable to be attacked by toxins. Excess of phosphates in the bathing fluids would depress the ionisation of the calcium. The effect of parathyroid extract on the blood was to raise the calcium and lower the phosphate. In a recent case of parathyroid tumour the serum calcium before operation was 15·33, and the plasma phosphorus at the same date 2·2; whereas eleven months after operating on the tumour the calcium was 9·3, the phosphorus 3·6. And in a case of parathyroid tetany the condition would not have been diagnosed had not the cerebro-spinal fluid been examined.

THE VALUE OF PARATHYROID.

A valuable drug to use in bringing about a calcium rise and a fall in phosphate was Parathormone. The difficulty in its administration was the considerable difference in response of different individuals.

A boy, aged about 10, with active chorea was given parathormone. Before treatment his calcium figure was 4·7, instead of the normal 5·4. Nearly a month later, after receiving 0·2 c.cm. of parathormone twice daily, there was no improvement and no effect was noted on the fluid. For another six weeks he was given the same dosage of parathormone supplemented by calcium chloride intramuscularly, and six weeks thereafter, with the calcium at 5·7, he was completely free of his chorea.

In the resistant cases of chorea an adequate amount of vitamin D and ultra-violet light were needed. The price of parathormone—nearly 3*s.* per c.cm.—rendered it expensive for regular administration. All the subjects of chorea examined showed a heightened electrical excitability in the nerves, and responded to smaller currents than children did normally. From 75 to 80 per cent. of cases of chorea were benefited by parathormone, some of them strikingly so. In the first 20 cases the chorea ceased in four and a half weeks, on the average. A girl, aged 11, had such severe chorea that she rubbed through three sheets within 24 hours of admission, but under this treatment the chorea had gone in 16 days.

In three cases of advanced progressive *muscular atrophy* parathormone was of definite value, though in two it was of no value. Of three cases of the Werdnig-Hoffmann type, two died of intercurrent infection before treatment was begun, but the third did well. In three cases of pseudohypertrophic muscular dystrophy the findings were normal, in contrast with an instance of facio-scapulo-humeral dystrophy which had a cerebro-spinal fluid calcium value of 4·42, which improved after parathormone.

A striking result was achieved with the substance in a case diagnosed as *Schilder's encephalitis*. Its use was suggested by the low calcium and the high phosphate. The patient when seen was comatose, with white optic discs. He was aged 9, and was admitted because of involuntary incoördinate movements of arms, legs, and face. There was no heart lesion. He quickly became almost blind. His diaphragm seemed to be moving in response to his heart beat. The cerebro-spinal fluid showed no evidence of infection. The calcium and phosphate values improved, and the discs almost resumed their normal appearance and colour. It must be very rare, said Dr. Warner, for optic degeneration to recover after having been so marked.

In conclusion it was pointed out, for the benefit of anyone wishing to work on these lines, that the amounts of calcium and phosphorus dealt with were very small, requiring accurate analysis.

Dr. Hampson added that the boy with Schilder's encephalitis won a scholarship last year, at the age of 12, a good indication that the remainder of his cortex had recovered.

(*Continued from previous page.*)

extended leave from a mental hospital, suffering from a senile type of dementia. He was thought to have no syphilitic taint, the blood Wassermann reaction being negative.

Thus the exact cause of the retention which preceded rupture of the bladder was not ascertained, but it is possible that the case was one of tabo-paresis simulating the depredations of advancing years. The ulcerative nature and small size of the perforation is of interest, and also the fact that it had existed for two hours with a bladder which still contained well over a pint of fluid.

My thanks for permission to publish this case are due to Mr. Meyrick Thomas, under whose care it was admitted.

The case is of interest in that it indicates that in this case as least neo-stibosan showed itself to be much more potent than the older compound, von Heyden 471 (stibosan). Against this it might be argued that the difference in the effect was produced because the one drug was given intravenously whereas the other was given intramuscularly, but in actual fact a marked difference was noticed in the child even after two preliminary intramuscular injections of neo-stibosan had been given. Table I. gives the dosage.

After three weeks of normal temperature following the conclusion of treatment the patient was discharged from hospital on Dec. 10th, 1931, as cured, the mother being instructed to report progress in due course. The first report dated Jan. 10th, 1932, states that the progress has been maintained and that there are no signs of the disease, the child being well and happy and extremely active. On Jan. 21st the mother brought the child up for examination. She stated that progress had gone on uninterruptedly and there were no further signs of the disease. The examination confirmed this, showing a perfectly healthy little girl. The spleen had gone down very considerably since the time of leaving hospital and was now just palpable under the costal margin. There was no further distension of the abdomen, the colour of the conjunctiva and lips was perfect, and there is no doubt that the child is cured.

JAPANESE SCHISTOSOMIASIS.

Mr. B., an Englishman, aged 29, was admitted to the Hospital for Tropical Diseases on Dec. 7th, 1931, complaining of swelling of the muscles of the arms and legs, accompanied by a rash 15 weeks ago, and of general weakness.

History.—He was born in London, where he has lived most of his life. In March, 1928, went to Shanghai and remained there until October, 1931. Has always lived an athletic life and until the present condition arose has never had any serious illness. Apart from childish ailments, he had had no illness of note. No venereal disease.

Present illness.—This started at the end of July, 1931. At this time he was rowing in his spare time and was in the habit of bathing in the river and creeks afterwards. He first noticed swellings on the flexor surfaces of the arm and forearm and on the anterior surface of the thigh. These swellings were tender and were covered with a vivid red rash which felt warm but did not itch. At the time that this appeared he began to feel tired and listless and this feeling has persisted since. The rash was accompanied by evening fever, both disappearing after two or three days. Since the illness started he has lost weight, but has had no trouble with micturition or with his bowels.

A friend of his who was in the habit of bathing with him also developed similar symptoms at the same time, and was found to be suffering from *Schistosoma japonicum* infection.

State on admission.—Very pale, no signs of any rash or muscular swellings. Conjunctiva not anæmic. Systems: heart and lungs normal. Abdomen: spleen just palpable, liver edge palpable, liver not enlarged upwards. A skin test for filariasis was negative, while that for bilharziasis was positive as was also the complement-fixation test. Blood: Wassermann reaction negative. The blood count was as follows:—

Red cells ..	5,120,000	Polymorph.	35 %
White cells ..	9,400	Large mono.	4 %
Hæmoglobin ..	96 %	Lymphocytes	39 %
		Eosinophils	20 %
		Mast cells	2 %

No malarial parasites found.

Urine: no deposit: no albumin or sugar. Fæces ova of *S. japonicum*, scanty; unfertilised ascaris ova present no protozoa.

Treatment and progress.—It was decided to treat the case by intramuscular injections of neo-antimosan (Fouadin) as Khalil had reported favourably on this preparation in the treatment of schistosomiasis in Egypt. The whole course of ten injections was given in 13 days, no untoward effects were produced, and the ova rapidly disappeared from the stools. Table II. shows the amount of neo-antimosan given.

TABLE II.

Day of treatment.	Injection of neo-antimosan intramuscularly.	Remarks.
1 Dec. 15th, 1931.	1·5 c.cm.	No reaction. Few ova found.
2	3·5 ,,	—
3	5·0 ,,	Three slides examined, one ovum found.
5	5·0 ,,	No ova found.
6	5·0 ,,	Four slides examined, one ovum found.
7	5·0 ,,	—
9	5·0 ,,	No ova found.
10	5·0 ,,	No ova found.
12	5·0 ,,	—
13 Dec. 27th, 1931.	5·0 ,,	No ova found.

The patient left hospital on Dec. 28th, 1931. and on Jan. 6th, nine days later, the fæces were examined and no ova found. Since that date he has reported again saying that he now feels well and fit in every way, and that all signs of weakness have disappeared.

A CASE OF PERFORATION OF THE BLADDER.

By STEPHEN POWER, M.S. LOND., F.R.C.S. ENG.,

RESIDENT SURGICAL OFFICER, MILLER GENERAL HOSPITAL, GREENWICH.

IN the routine of emergency surgery it is not often that a strikingly unusual case occurs, and its occurrence is perhaps sufficient excuse for description, even though no great addition is thereby made to surgical lore.

A man, aged 61, was recently admitted to the Miller General Hospital with a history of having had retention of urine for several days, relieved by his doctor with a catheter. Two hours before admission he was seized with sudden acute abdominal pain following an attempt to micturate; there was no vomiting. In an attempt to correlate his story one thought at once of rupture of the bladder, but catheterisation produced 20 oz. of heavily infected urine, without emptying the organ. The abdomen wa generally tender and guarded, these features being most marked in the epigastric region where was found a veritabl diagnostic herring in the shape of a tense fatty hernia o the linea alba. The cause of this retention was not obviou since the prostate was small. Examination of the centra nervous system revealed absent knee-jerks with norma pupils.

The patient's general condition was poor, his heart bein enlarged and his arteries tortuous. However, I decide to explore his hernia under a local anæsthetic.

A sac about 1 in. long and ½ in. wide was found in th middle of the fat, and was empty. On removal some blood stained fluid could be seen in the peritoneal cavity. Th orifice being enlarged, a gush of urine expelled itself, althoug one could still feel a full bladder above the pubis. A genera anæsthetic being initiated, a suprapubic incision was mad and much urine voided from the abdomen. An ancho suture passed through the fundus of the bladder cut ou immediately and leakage had to be stopped with a purse string. Fortunately, the actual perforation was close b and showed itself to be the size of about the head of a pi surrounded by a yellowish sloughing area, and expellin gushes of urine even now. It was surrounded by a purs string. At this time the fundus of the bladder had th consistence almost of wet blotting-paper and must have bee even more attenuated before the burst. Appearances we not in the least suggestive of a traumatic rupture. Th bladder was opened and the prostate felt. There was n intravesical projection, and only a slight cleft in fron The bladder mucosa showed a foul cystitis. Proceeding were terminated by draining the pouch of Douglas and th bladder.

On the following day the patient's condition appeare to be quite good, but he succumbed within 18 hours. Post mortem examination confirmed the operative findings, an suspected condition of cardiovascular system, withou definite evidence of syphilis. It transpired that he was o

(Continued at foot of opposite page.)

died from fracture of the skull soon after admission to hospital. Her clinical history was unknown. The specimen showed :—

Coarctation of aorta just below point of entry of closed ductus arteriosus; calcification at this spot. Large anomalous vessel arising just above coarctation running to right, between the spine and the œsophagus, to supply the place of the innominate, and to form the right subclavian. Heart: slight hypertrophy in left ventricle. Aortic valves normal. Slight aortic atheroma. Vessels of both thyroid axes were large; also long thoracic and posterior scapular arteries; internal mammary arteries very large.

Mr. Harold Edwards showed a case of *Hæmolymphangioma of the Tongue* in a woman, aged 29. When two years old she had partial glossectomy for hæmolymphangioma of the tongue. The whole tongue and the floor of the mouth are now covered with growth which is at present stationary and has remained unchanged for several years.

Mr. Edwards also showed a case of *Carcinoma of the Tongue* 19 years after Whitehead's operation. A man, now aged 78, in 1913 had the right half of tongue removed for carcinoma, and 14 days later the glands on the right side of the neck removed. The pathological report on the tongue growth was squamous-celled carcinoma. No microscopical evidence of secondaries in excised lymphatic glands was found. Four months after the second operation a recurrent mass was removed from neck. The function of the remaining portion of the tongue was now excellent, said Mr. Edwards, and there were no signs of recurrence.

Dr. J. D. Rolleston showed a case of *Striæ Atrophicæ following Rheumatic Fever* in a man, aged 21, admitted to hospital on Sept. 26th, 1931, suffering from diphtheria, but found after admission to have rheumatic fever which had become complicated by endocarditis, albuminuria, and pleuropneumonia.

Temperature pursued an irregular course, oscillating between normal and 104·6° F. till Nov. 17th, the fifty-eighth day of disease, when it finally became normal. The striæ, which were situated on the back, arms, buttocks, and thighs, were first seen on Oct. 30th, the thirty-seventh day of disease. On the back they extended from the level of the lower angle of the scapula to that of the lumbar vertebræ, were transverse in direction, pinkish or livid red in colour, depressed below the level of the normal skin, and measured from 1 to 2½ in. long and about ¼ in. broad. On the left side they extended lower down than on the right, and passed round to the ventral aspect. On the buttocks and posterior part of the thighs their arrangement was longitudinal. A few faint striæ were seen on posterior aspects of both upper arms.

Dr. H. S. Le Marquand showed a case of *Suprarenal Virilism* (pubertas præcox) in a male child, aged 2 years. Pubic hair was first noticed at about the age of 14 months; since then the development of the sexual organs and general bodily growth had proceeded at an abnormally rapid rate. During the last few months his sexual proclivities had caused trouble. His parents stated that he could not be left alone with an adult woman because of the obvious sexual advances which he made; he was not attracted by small girls. These statements had been corroborated by observation in hospital.

On examination, a strong active red-headed boy, who appears to be between 6 and 7 years old. Height 3 ft. 5½ in., weight 40 lb. (average 2 ft. 11½ in. and 30½ lb.). Muscular development very pronounced, approaching the infant Hercules type. Mental development about that of a child of 2; he is exceedingly mischievous. Development of hair: pubic hair well-marked, with a horizontal upper limit; hair prominent on forearms and legs below the knee, with a lesser distribution on the back and thighs; no hair in the axillæ. Genital organs: the penis, scrotum, and testicles are well-developed, almost the size of those of an adult.

ASSOCIATION OF CLINICAL PATHOLOGISTS.

The fifth annual meeting of this association was held in the Bland-Sutton Institute of Pathology, Middlesex Hospital, on Jan. 30th, Dr. L. E. H. Whitby being in the chair.

ASCHHEIM-ZONDEK TEST.

Dr. A. F. Wright spoke of the value of this reaction in the diagnosis or exclusion of pregnancy long before this was possible by any other means; he produced figures based on his own observations and those of others showing that once pregnancy was established the reaction would, in over 97 per cent. cases, give a definite and correct answer to the question "is this subject pregnant?" His own work suggested the possibility of error in ectopic pregnancies; absent or weak reaction in a woman known to be pregnant might serve as a warning of threatened abortion. He described the method of obtaining a quick reaction by precipitating the active principle from the urine with alcohol and injecting it intravenously into a rabbit; this he had found satisfactory.—Dr. A. G. Shera asked what was the value of the test in the diagnosis of chorion-epithelioma, whether the reaction was positive as in other types of malignant disease.—Dr. S. C. Dyke said he had found the test positive in chorion-epithelioma and pointed out that the persistence of a positive reaction in a woman who had recently been confined or had aborted was strong evidence of the presence of growth of this type.—Dr. E. Wordley stated that in the absence of pregnancy he had found the reaction negative in the subjects of malignant disease, either male or female.—Dr. Wright, in reply, spoke of the necessity of cutting sections of the ovaries for microscopical examination in all doubtful cases.

BACTERIOLOGY OF NORMAL TEETH.

Dr. J. B. Davey remarked on the present tendency to attribute many rheumatic and other infections to apical infection of teeth, the streptococcus being the organism usually implicated; in support of this is adduced the fact that streptococci are practically always to be isolated from the infected apices of such teeth. He had himself isolated many such strains and had found that for the most part they were non-hæmolytic and of the type usually found in the mouth, though some might give slight hæmolysis of the α type. He described the result of examining 13 healthy teeth and 8 which would have been passed as healthy on any except the most rigorous tests; all had been removed for cosmetic or other reasons and not on account of caries or infection. From the tips of 11 of the 13 healthy teeth, and from 7 of the 8 teeth not above suspicion he had isolated streptococci. The root canal of the healthy tooth also gave a growth of streptococci.—Dr. F. B. Smith pointed out that similar findings had resulted from an investigation made some years ago by the late Prof. E. E. Glynn.

BACTERIOPHAGE IN B. COLI INFECTION.

Dr. Whitby spoke of the use of bacteriophage in the treatment of *B. coli* infection of the urinary tract. In acute cases the phage did not appear in the urine until it became alkaline, but it would often do so on the day following alkalisation, with rapid disappearance of the infection. In chronic cases the phage failed to appear in the urine at all. He pointed out that organisms which survived the initial attack of the

DISCUSSION.

The **PRESIDENT** thought the series of cases narrated were striking, though the work was still in a preliminary stage. If all refractory cases of chorea could be cured by giving parathormone and calcium salts, it would represent a great advance. He recently had a case of exophthalmic goitre in the active stage of which there was a loss of calcium. Possibly this loss might be the cause of the great weakness in these patients. The blood-calcium was 5·4.

Dr. **HAMPSON** said there was a group of people, showing clinical hyperthyroidism, with low calcium values; they had irritable nerves with low threshold for electrical stimulation. They were also those who passed into a state of tetany after operation. He thought they had parathyroid deficiency.

Dr. **N. GRAY HILL** said that at Queen Mary's Hospital, Carshalton, parathyroid was given in a number of cases of chorea, but it was an expensive preparation for institutional use; less costly methods succeeded. Some cases of chorea cleared up on nothing but rest and a quiet life, while others remained choreic in spite of any treatment. Treatments which promoted rise of blood-calcium were good for chorea. It seemed to him scarcely justifiable to take the cerebro-spinal fluid of choreic patients for examination, though if its examination was shown to be important that scruple would have to be waived. At his institution only blood examinations were made. Treatment was by diet, ultra-violet light, and calcium preparations, largely by mouth. But no two choreics followed an identical course.

Mr. **W. C. W. NIXON** said he had investigated a series of cases of eclampsia and of pre-eclamptic toxæmia of pregnancy. In two cases, in which he had obtained blood during the fits, the serum calcium was found to be between the normal limits. During the premonitory twitchings, before the actual eclamptic state, the serum calcium was not reduced. He did not assess the calcium value in the cerebro-spinal fluid, but he hoped to do so. He had given calcium gluconate, but without effect on the fits.

Dr. **P. ELLMAN** said that in 1926–27 he had investigated calcium metabolism in cases of pulmonary disease, both active and chronic; he found that the calcium content of the blood varied within the normal limits of 9 to 11 mg. He concluded that the metabolism of calcium in the tuberculous subject could be influenced by calcium and parathyroid as surely as the sugar in the urine could be influenced by a course of insulin. In a case in which the blood-calcium was low and the symptoms were active, with cough, sputum, hæmoptysis, night sweats, and loss of weight, when the calcium content had been raised to 11 the symptoms largely subsided and the patient gained in weight.

Dr. **PARKES WEBER** suggested it might be well worth while to try the effect of this treatment in recurrent angio-spastic attacks in small children, a rare condition akin to Raynaud's disease. These attacks might almost be regarded as vasomotor tetany.

Dr. **E. STOLKIND** commented on the striking result in the case of Schilder's encephalitis, especially the staying of the atrophy of the optic discs and the marked progress to recovery. Some of his own patients who suffered from encephalitis lethargica had subsequently passed Civil Service and other competitive examinations.

Dr. **DOROTHY HARE** asked whether, in view of this work, the readers of the paper would agree it was better to cease estimating blood-serum calcium, and concentrate on the cerebro-spinal fluid values, as being the more likely to afford therapeutic aid.

Dr. **HAMPSON**, in reply, said he had not worked much on the calcium content in cases of eclampsia but he had gone into the phosphate metabolism. His conclusion was that these cases belonged to group almost opposite to those now being discussed and probably parathormone would be more likel to do harm than good in them.

Dr. **WARNER**, in reply, said that as lumbar punctur was not dangerous it should be done whenever i was likely to yield results valuable in treatment There were a number of diseases which showe increased electrical excitability; Graves's disease wa one. He and his colleague did not regard paratho mone as a specific drug. They found low calciu and high phosphorus values, and they tried to recti that. The only drug which caused a rapid respon appeared to be parathormone. Its effect, howeve was not lasting, a small dose was not operative aft eight or ten hours, which pointed to the need of givi it twice daily. Perhaps after producing the ma effect progress could be maintained by other mear The striking benefit was seen in the hopeless dystroph cases, in which there was no question (as in chore of improvement if left alone.

CLINICAL SECTION.

Exhibition of Cases and Specimens.

A MEETING of this section was held on Feb. 12 with Mr. **CECIL P. G. WAKELEY**, the President, the chair.

The **PRESIDENT** showed a patient, aged 57, w an enormous *Left Renal Tumour* which almost fil the whole abdominal cavity and was hard a craggy on palpation. There were no urinary syn toms, but there were secondary deposits in t liver, in the glands on the left side of the neck, a in both groins. A large opaque deposit could be se in a radiogram, involving the right side of the innominatum. There were no signs of second deposits in the chest, nor any sign of varicocele œdema of the left leg, in spite of the fact that tumour was of such a large size. Mr. Wakeley s that glandular deposits in renal tumours must looked upon as very uncommon.

Dr. **BERNARD MYERS** showed a case of *Milr Disease* in a woman, aged 47, who had suffered fr swelling of the right leg from infancy. All availa methods of treatment failed to cure the conditi and at present the patient was taking pituitary wh gland gr. ½ twice daily.

Dr. **TERENCE EAST** showed a case of *Coarctation the Aorta* in a man, aged 55. There were so large veins over the upper part of the sternum in t left supraspinous fossa. There were large palpa arteries with a systolic thrill and intense murm The pulses were unequal; the blood pressure, l arm, 195/145; right arm, 135/100. The heart w enlarged with extensive apex-beat, which was rat weak, the first sound being reduplicated, and t aortic second loud. The electrocardiogram was the left ventricular type, with abnormality in t T waves in the first and third leads, associat probably with the changes due to the high blo pressure. Wassermann reaction, negative. Uri normal.

Dr. East also showed a *specimen of coarctati* of the aorta removed from a woman, aged 46, w could be removed for section. Direct examination of the trachea was useful where a foreign body was present, and, recently, had also been used in diphtheria; sloughs could be removed by means of the bronchoscope, and tracheotomy or intubation might thus be avoided.

The bronchoscope was usually introduced through the laryngoscope, which was then withdrawn; the withdrawal of the laryngoscope was the only part of the examination which was likely to cause discomfort to the patient. Cough might be prevented by the application of cocaine, but it was sometimes undesirable to abolish cough. Where a foreign body had been inhaled the bronchoscope had proved invaluable in saving life, and the method should be successful in almost every case. Among the 21 cases already mentioned foreign bodies had been successfully removed in 20; the exception being an open safety-pin whose point had entered the pericardium.

The inhalation of the foreign body might cause an abscess of the lung. In one case an abscess had formed owing to the presence of a complete vertebra of a rabbit; this was removed and nine more bronchoscopic aspirations had to be performed to drain the abscess, but the patient made a good recovery. In eight other cases in the series lung abscess was secondary to the presence of a foreign body. Abscess might also follow operations, especially those on the nose and throat. If bronchoscopy were employed earlier in such cases the proportion of cures would be higher. In one case, where 25 teeth had been extracted, a lung abscess had cleared up after the removal of a piece of infected clot which was plugging a bronchus, and in another case, where 18 teeth had been removed, an abscess cleared up after two bronchoscopic aspirations. In neither case had a tooth been inhaled. It was important that bronchoscopy should not be delayed in such cases simply because radiography showed no foreign body. Of six cases of post-operative lung abscess five were cured, one two years after the operation and one a month after; one of the six was improved considerably, and later was cured by external drainage. Lung abscess might also follow pneumonia or quinsy, or might arise without apparent cause. Repeated bronchoscopic aspiration sometimes cured the patient and nearly always improved his condition so that he was fitter to stand the operation for external drainage.

In order to perform aspiration a fine aspirating tube with a gum elastic end was passed down the bronchoscope. As pus oozed from an abscess cavity granulations formed in the bronchi draining it; the bronchi normally contracted on expiration, and if they were partly occluded by granulations they were closed completely, so that postural coughing was quite ineffective in draining the abscess. With the bronchoscope in position, holding open the partially stenosed walls of the bronchi, the patient was able to cough the pus out of the abscess cavity so that it could be aspirated; the granulations could then be painted with silver nitrate.

In bronchiectasis the results of aspiration were not so good, but the patient's condition could often be improved. Direct examination made a definite diagnosis possible where new growth was suspected; in some cases it might demonstrate that only asthma or bronchitis was *present, and in a few cases the new* growth might be an innocent fibroma which could be removed.

THE ŒSOPHAGOSCOPE.

Mr. H. S. **Souttar** said that he had had considerable experience of the treatment of carcinoma of the œsophagus and, while no one could do much for the patient, it was usually possible to make him able to swallow. In order that the operator might perform the necessary manipulations an instrument with a wider lumen than Chevalier Jackson's was required, and like Mr. Negus, he used a light which threw the beam ahead. The œsophagoscope which he employed was 10, 14, or 18 inches in length, depending on the site of the growth, and the lumen was sufficiently wide to allow the tube which was to be passed through the growth to be introduced down the œsophagoscope He found it best to introduce the instrument at the angle of the mouth, with the position of the head in the normal relation to the body; as the instrument slid into the concavity of the thorax the head had to be lifted forwards and, as it passed lower down, the thorax, but not the neck, required to be straightened out. When a point was reached at which the operator saw that the œsophagus was not opening and closing with respiration he knew that the growth was under observation. Usually the tumour began to bleed, and an aspirating tube and a stream of hot water were necessary to keep the field of operation clear. Bougies with a detachable soft end were passed through the stricture, and then the lumen was further stretched by passing dilators down, threaded over the bougie. The tube to be inserted was made of closely coiled wire, about 5 inches long with a shoulder at the top and a spiral twist occupying 2 or 3 inches in the middle of its length; this spiral twist helped to keep it in position. Mr. Souttar had treated one patient who had kept the tube in position for 18 months, but the disease usually proved fatal long before that time. He had lately been treating these cases with radon seeds, placing them accurately and symmetrically in position by means of a plunger which delivered them when a button was pressed. He had been fairly successful in arresting the rate of growth temporarily, and in causing temporary regression in some cases by the use of this method. He had recently designed a new œsophagoscope by which he hoped to deliver radon seeds into the growth with still greater accuracy.

DISCUSSION.

Mr. C. **Hamblen Thomas** described two cases in which endoscopy had proved valuable. In the first, radiography had shown a brass paper clip in the thorax, but it was doubtful whether it was lodged in the lung or the mediastinum; bronchoscopy solved the doubt and the foreign body was removed. In the second case bronchoscopy established a diagnosis of bronchiectatic abscess.

Prof. J. G. **Wright** said that impaction of a foreign body in the œsophagus occurred frequently in puppies. The usual method of treatment was œsophagotomy with removal of the foreign body. In one case where the œsophagoscope had been employed the piece of bone causing obstruction was too large to be removed through the lumen of the tube. The dog was deeply narcotised with morphine and the pressure of the œsophagoscope on the larynx had been sufficient to cause death.

Mr. A. **Dickson Wright** said that he had found that in aspiration of lung abscess the amount of pus removed was small. Chevalier Jackson attributed the improvement following aspiration to the fact that the pus was so viscid that the patient would never have been able to cough it up. He thought it wise to anticipate the rupture of an abscess into a bronchus by aspirating the pus even from a closed abscess. If the case was allowed to take its course the patient was in danger of drowning in pus when the abscess ruptured. Few London hospitals had the proper equipment for the employment of endoscopic methods phage were resistant and able to propagate a resistant strain; it was therefore necessary to give a large dose of a high-titre strain. Many of the phages on the market were of low titre and should not be used until the titre had been raised by subculture with susceptible organisms; he regarded crude sewage as the best source of potent phage. Cultivation and increase of potency of the phage was better carried out at room than incubator temperature. The phage could be administered by mouth, hypodermically or locally; hypodermically he gave 2 c.cm. three times a day for three days.—Dr. **Dyke** adduced evidence in favour of the belief that so-called acute pyelitis was always associated with small abscesses in the cortex of the kidney; if this were so local instillation of the phage into the urinary passages was not a rational method of its employment.—Dr. **Cuthbert Dukes** said he had never been able to find evidence that lesions in the intestines would permit of the passage of *B. coli* to the urinary system.—Dr. D. **Embleton** stated that bacilluria was frequently associated with chronic constipation, particularly in habitual users of cascara; in such cases when the bacilluria had disappeared it could be brought back again by a dose of cascara.—Dr. **Whitby**, in replying, agreed that local instillation of the phage had little to commend it; he favoured the hypodermic route.

CONVALESCENT HUMAN SERUM.

Dr. A. G. **Signy** described his experiences in the production of immunity with convalescent human serum, with particular reference to measles. He recommended collection of blood from 10 to 14 days after defervescence, the serum being pipetted off the following day. This was tested by means of the Wassermann reaction and for sterility; all sera were then pooled and put up in ampoules with 0·5 per cent. carbolic. Such serum would maintain its potency if kept in the ice-chest for at least a year. Injection of serum within five days of exposure would prevent the disease appearing; up to the ninth day from exposure it would result in an abortive attack; thereafter it was ineffective. He drew attention to the advantages accruing from an abortive attack in the development of active immunity. Such attacks were usually so mild as not to necessitate confinement to bed. He described a method of producing an active immunity without an actual attack of the disease by injecting first a large dose of immune serum, followed 24 hours later by 1 c.cm. of blood from a case in the infective stage. He recommended a dose of 7 c.cm. for children up to 3 years of age; 10 c.cm. for older children. He drew attention to the value of convalescent serum in poliomyelitis, adding that the opportunity for its use seldom arose in this country.—Dr. J. G. **Greenfield** described the methods in use in the early treatment of poliomyelitis in Australia. Polymorph cells, he said, appear in the cerebro-spinal fluid in the early stages of the infection and before paralytic symptoms appear; they become progressively fewer as the disease declares itself. Australian experience had shown the dosage of serum was in inverse proportion to the number of these cells in the cerebro-spinal fluid.

UREA CLEARANCE.

Dr. E. **Wordley** described the Van Slyke urea clearance test of renal efficiency. This test he pointed out was regarded by its originators as an indication of the rate of clearance per unit of time of urea from the blood. It was calculated from the formula $\frac{U}{B}\sqrt{V}$ where U represents the urea in the urine, B that in the blood, and V the volume of urine secreted per minute over one hour. Where the rate of excretion of urine was high the formula $\frac{U \times V}{B}$ must be used. For the first formula a normal clearance figure was anything over 54, for the second, anything over 75. The speaker stated that he had determined the clearance figure in a number of cases and had found it to give results accurately according with the clinical condition and with the results of other tests of renal function.

Dr. **Greenfield** gave an address on the microscopical differentiation of cerebral tumours, showing specimens and slides illustrating many types of cerebral tumour. He drew attention to the clinical and histological differences between those o gliomatous and ependymal origin and described classification considerably simpler than that o Cushing, but which appeared to cover all types me with. A relatively benign and slow-growing tumou was the oligo-dendroglioma.—Prof. J. **McIntos** expressed the hope that simplification might b carried even further.

HARVEIAN SOCIETY.

A meeting of this society on Feb. 11th, with M C. P. G. **Wakeley**, the President, in the chai was devoted to a discussion on

Endoscopic Methods.

Mr. V. E. **Negus** said that the usual view was tha the bronchoscope was useful only for the removal o foreign bodies, but this was no longer the mai field in which it was employed at King's Colleg Hospital. Since 1924 the total number of patient examined by the bronchoscope for foreign body ha been 21, while in the same period no less than 36 bronchoscopic examinations had been made, on total of 95 patients, for other conditions. M Negus found that the ordinary bronchoscope wit distal illumination served all his purposes, and he di not agree with the view of some observers that th lumen was too small. The small diameter of th tube made it mobile and easy to insert; in cases o carcinoma it might be difficult to see the dist parts of the growth, but for these cases he employed modification of the instrument in which the light wa thrown ahead and not shielded. In laryngoscop he used a similar type of light. In Chevalier Jackson clinic two or three skilled assistants were require at a bronchoscopic examination, and it had bee suggested that bronchoscopy could never becom popular in England because the regular changes i the staff of resident hospital officers would mak the training of such skilled assistants impracticabl By the aid of the Haslinger head-rest, however, th surgeon could now perform the examination singl handed, and without the services of an anæsthetis Bronchoscopy was therefore the more valuable i cases where a general anæsthetic was contra-indicate Where a foreign body was lodged in the larynx th patient should be examined lying on an incline plane with his feet higher than his head; in thi position there was no danger that the foreign bod would fall into the trachea or bronchi when it wa dislodged. In children indirect examination wa often difficult, and laryngoscopy was to be preferre for example, in examining a child for papilloma o the larynx. Laryngeal growths of all kinds could b studied by this method, and if necessary a portio slender reasons, and that a certificate often meant a licence to play in the streets. When a panel patient was really ill the burden of his care fell on the hospital, and the National Insurance scheme ought to recognise that work in some quite definite way. A serious illness in a middle-class family meant a financial crisis; the voluntary hospital had instituted small paying wards, but this accommodation was far too scanty. Municipal nursing homes, like those of Scandinavia, were an inevitable step. The voluntary hospital, he said, had ceased to exist as such, and patients often complained that they could not afford to be treated in it. The only voluntary thing left was the consulting staff. If voluntary hospitals were to continue, said the speaker, let them be run on a sound financial basis, and not have to descend to the level of sending out their students dressed as nigger minstrels with barrel-organs to collect funds.

Dr. **Howard Stratford** said that the point of real difficulty in the relationship between public and private medical men lay in the clinics. It was felt by general practitioners, and also by the British Medical Association, that the basis of a national medical scheme should be the provision of the services of a general practitioner or family doctor to every individual. In emergency the family doctor and no one else was called in. Every clinic should display a large notice: "Have you a family doctor? If not get one!"

The **President** agreed that public and private doctors should hold periodical conferences. Private practitioners, he said, either singly or in combination, should start clinics for periodical examination—especially of expectant mothers—for the "better classes." These centres might reduce the incidence of rickets in well-to-do children to the low level achieved among the poor by the present welfare clinic.

NORTH OF ENGLAND OBSTETRICAL AND GYNÆCOLOGICAL SOCIETY.

A meeting of this society was held in Manchester on Jan. 22nd, with Dr. F. H. **Lacey**, the President, in the chair.

PROLAPSE WITH STRANGULATION OF THE URETHRA.

Prof. **Leith Murray** (Liverpool), after a reference to the infrequency of a clear definition of the condition in text-books, described four cases of prolapse with strangulation of the urethra. All the patients were elderly multiparæ, their ages ranging from 67 to 84, and all had similar symptoms and physical signs—namely, considerable local pain, marked urinary frequency, especially by day, difficulty in walking, and a blood-stained discharge. He thought that strangulation of the protruding mass must occur at some stage of the process, owing to the marked livid colour, and that, although infection was present, this must be secondary. There was no tendency to urinary retention, so there appeared to be no urgency in the treatment, which consisted in the application of adrenalin and chloretone ointment for a day or two, replacement of the urethra by finger pressure (under anæsthesia in two cases), and the use of a self-containing catheter for a few days. There was no recurrence in three of the cases over a period of one to four years, but in a fragile old lady of 84 there was a slight recurrence for ten days after removal of the catheter. This was controlled by daily observation and reposition, and the patient was reported to have been free from symptoms during the last seven months.

ASCHHEIM-ZONDEK TEST IN ECTOPIC PREGNANCY.

Mr. W. W. **King** (Sheffield) described a case illustrating the value of the Aschheim-Zondek test in ectopic pregnancy in the presence of hydatidiform degeneration of the chorion. After referring to the rarity of cases in which the test could be of definite clinical value in ectopic pregnancy, he paid tribute to the support it gave in confirming the necessity for immediate operation in a difficult case.

The patient had gone 17 days over her time before the so-called period commenced, but this delay as well as certain indefinite symptoms such as pains in abdomen and left shoulder were ascribed to "chills," "over-eating," and "rheumatism" respectively. The only physical sign was the doubtful presence of free fluid, and even under anæsthesia no suspicious appendage swelling was palpable; but on arrival of a positive report on the urine, operation was insisted upon. Laparotomy showed free blood, which was mostly clotted, in the peritoneal cavity and a tubal mole which revealed naked-eye and microscopical evidence of early vesicular degeneration. The presence of this degeneration would account for the positive reaction in spite of the fact that the fœtus was apparently dead.

Mr. King referred to the greater relative frequency of vesicular degeneration of the chorion in tubal than in uterine pregnancies.

The **President** said he had found needling the pouch of Douglas helpful in the diagnosis of doubtful cases of tubal gestation.

Dr. M. M. **Datnow** (Liverpool) said he had carried out the test in three cases of tubal pregnancy, with a correct result in each case, and therefore considered it of value in arriving at a diagnosis. He believed that the reaction was never positive more than 48 hours after delivery or abortion except in cases of hydatidiform mole or where chorion-epithelioma had developed.

TWISTED HYDROSALPINX.

Mr. J. E. **Stacey** (Sheffield) showed a specimen of a twisted hydrosalpinx removed from a nulliparous woman aged 29, who had been married for four years and had complained of abdominal pain (with premenstrual exacerbations) for three years. She sought medical advice on account of sterility alone.

Bimanual examination revealed a retroverted uterus with a mass of enlarged matted appendages palpable in the pouch of Douglas, and as Rubin's test was negative a laparotomy was performed. It was found that the right tube had been converted into a hydrosalpinx 5 in. long which had undergone one complete twist and contained blood-stained serous fluid. In the process of torsion the broad ligament had been torn and there was a large hiatus in it, thus preventing the ovary being involved, but this organ was cystic and bound down by adhesions. Right salpingectomy was performed, and as the left tube was thickened and the lumen occluded at the fimbrial end, left salpingostomy was carried out, and an infected retrocæcal appendix was also removed.

Mr. Stacey discussed whether salpingostomy was preferable to a more radical operation in patients complaining of pain and sterility, and mentioned one case in which pregnancy had followed bilateral salpingostomy.

DEGENERATING FIBROID.

Dr. C. P. **Brentnall** showed a specimen of a fibroid with red and cystic degeneration, removed from a primigravida aged 27, who had complained of continuous pain and tenderness apparently due to the tumour, and present for four months. The fibroid, which was extensively adherent to omentum and colon, was almost uniformly degenerate, and showed areas of cystic degeneration containing a fluid which, after fixation, somewhat resembled chocolate in appearance. Dr. Brentnall referred to the opinion

WEST LONDON MEDICO-CHIRURGICAL SOCIETY.

A MEETING of this society on Feb. 12th, with Dr. H. H. MILLS, the President, in the chair, was devoted to a discussion on

Public Health in its Relation to the General Practitioner.

Dr. J. B. HOWELL sketched the development of the public health movement towards the very wide ramifications of municipal health enterprise to-day. The foundation of this service was, he said, the general practitioner, and its success depended upon his capacity, competence, and clinical skill, and his training in preventive as well as in curative medicine. The practitioner in his turn depended upon the provision of the necessary facilities, and his art must keep pace with advancing science. The public medical services, so far from excluding him, gave him wide scope, being largely staffed by part-time workers. The whole of the National Health Insurance scheme was in the hands of the private practitioner; his duties under the State—particularly those of notification and certification—were wide and likely to increase still further.

Dr. Howell enumerated the facilities given to the private doctor by public medicine and the ways in which the practitioner could help the health officer. He expressed a desire for regular meetings between the practitioners and the public medical officers in each centre of population.

Dr. J. FENTON stated that at the time of the accession to the throne of Queen Victoria there had been no public health service. He outlined its history from Edwin Chadwick's work through the Public Health Acts of 1848 and 1875 until the beginning of the present century, when this country had been far in advance of all others in public health work. This work, however, had included no treatment except in fever hospitals, the primary business of which had been isolation. A desire had then arisen, he said, that public authorities should turn their attention to individual suffering; the establishment of bodies, such as the Kensington Health Society, which set up their own health centres had stimulated municipal enterprise, and infant welfare centres had multiplied. In 1914 the Government had undertaken to pay half the expenses of these clinics, which now numbered 2800. They were mainly staffed by part-time officers; moreover, before their advent the general practitioner had hardly concerned himself at all with the work which they did, for the poorest classes had not consulted doctors about the upbringing of their children. Similarly, the school medical service treated conditions in children which previously had never come to the general practitioner. School medical officers enforced the requirement that patients should first be referred to their own family doctors, but they rarely went and were rarely wanted. The tuberculosis service provided a special example of how local authorities could develop preventive medicine without encroaching on private practice. The tuberculosis clinic provided expert diagnosis, supervision of contacts, and selection of patients for sanatoriums, but did not undertake treatment; it referred to the private practitioner patients who could be treated at home. Before its establishment the poorer patients had been treated either at out-patient departments or under contract, and when they had become too ill to walk about they had entered poor-law hospitals or been treated at home by poor-law medical officers. The total expenditure on public health and social services had risen from £20,000,000 in 1891 to £348,000,000 at the present day.

THE PROFESSION UNDER A STATE SERVICE.

Dr. Fenton exhorted his audience to look at the future. A State medical service was inevitable and would come more quickly than they anticipated. The work of the doctors of the country was already very largely under the direct control of the State or the local authorities; he pointed out that hardly a member of the meeting was not employed in public medicine of some kind or another. The public hospitals in London outnumbered the voluntary hospitals in their accommodation by nine to one, and the almoners of the latter were striving day by day to get subscriptions from local authorities for special services. This tendency would be increased as the Act of 1929 was more fully operated. Moreover, he said, conditions of service under the State were better than those in private practice, just as the teacher in a State school was better paid and had better holidays than the teacher in a private school. The growth of State education had not decreased the demand for private education, and private practitioners would always be required. Practitioners who had little experience of State control feared that they would lose their independence under it; had the average general practitioner, he asked the society, more independence than their President or himself? The general practitioner worked in a very small area and had little time for research and little recreation. A public medical officer who acted with decorum and carried out his duties strictly had a measure of independence in his work which would surprise most general practitioners. The more that the profession did to help the coming of a State medical service, the more it would *do for* itself. State medicine had done much for the country; it had done more for the medical practitioner.

Dr. RONALD CARTER described his treatment of zymotic enteritis and other children's complaints at a municipal hospital. He said that "first-aid treatment" was most necessary and did not interfere with the general practitioner.

Dr. REMINGTON HOBBS asked for a closer liaison between the private practitioner, the hospital, and those responsible for postnatal treatment; this coöperation would reduce maternal mortality.

DISADVANTAGES OF STATE-CONTROLLED MEDICINE.

Sir ALLAN POWELL said that at the time of the Act of 1875 public health had been entirely a matter of sanitation; the health authorities of the country had known all there was to know about "pipes." They had then undertaken isolation, and then the treatment of the destitute, and latterly the public conscience had come to demand that the community should provide these lavish therapeutic services for all its members. He doubted whether the tendency was a good one, and pointed out the danger of teaching everybody in the country that he could have everything done for him for nothing out of the rates and taxes. He instanced some of the abuses of unemployment insurance. The greatness of the country had grown up on individual initiative, and it might not be good that all medical practitioners should be paid servants of the State with fixed salaries and holidays. The question was a most pressing one.

Dr. GERALD SLOT complained that many rheumatic heart children were certified as unfit for school for very

REVIEWS AND NOTICES OF BOOKS

Diseases of the Thyroid Gland,

With Special Reference to Thyrotoxicosis. By CECIL A. JOLL, M.S., B.Sc. Lond., F.R.C.S. Eng., Senior Surgeon to the Royal Free Hospital and the Miller General Hospital; Surgeon to the Cancer Hospital. London: William Heinemann (Medical Books), Ltd. 1932. Pp. 682. £3 3*s*.

IT is 30 years since any book dealing with the diseases of the thyroid gland and their treatment as a whole has been published in Great Britain. Mr. Joll's work has been awaited with no little interest. It fulfils the considerable expectations it has aroused, and is, indeed, a masterly presentation of the subject. The introductory chapters on anatomy and physiology are excellent summaries of an exceedingly wide field of work, and they are followed by a chapter on the parathyroids which is the only disappointing section of the book. We can only presume that the notes for it were compiled some years ago, for it contains no reference at all to hyperparathyroidism and the related cystic changes in bone, and the more recent work on calcium metabolism receives but very brief mention. Inflammatory conditions of the thyroid are well described, and the sections on endemic and sporadic simple goitre are admirable accounts, and well illustrated, of the present state of knowledge of this important subject. Relatively small space is allocated to the hypothyroid states, as is perhaps natural in a book mainly surgical in conception and scope; we could find no reference to those difficult cases of long-standing primary thyrotoxicosis in which symptoms of hypothyroidism develop at the same time. The sections of the book devoted to thyrotoxicosis are, however, excellent on the whole. Mr. Joll stresses the importance of undertaking surgical treatment sufficiently early in the disease to anticipate the visceral degeneration which inevitably occurs later, and which as well as affecting the operative risks must of necessity leave the patient with some degree of permanent disability. When considering operative results he says: "In certain countries medical opinion has for many years been so violently opposed to the operative treatment of exophthalmic goitre, doubtless as a consequence of the unsatisfactory immediate and remote results obtained by surgical measures in the first decade of the century, that patients are referred to the surgeon only when all other methods of treatment have failed and the various visceral lesions characteristic of the later stages of the disease are well advanced."

Mr. Joll's own mortality in 795 cases of thyrotoxicosis is 2·8 per cent., and he is able to show 90 per cent. of "cures" with a standard of cure which entails ability to pursue normal avocations, and, among women, the capacity to bear children without relapses. It redounds greatly to the credit of the pioneers in the surgery of the thyroid in this and other countries that what was not very long ago a dangerous operation has become in the hands of those experienced in this branch of surgery one of the safest of the major surgical operations.

Mr. Joll has undertaken no small task in dealing single-handed with the many manifestations of thyroid disease. The limitations inherent in single authorship are evident in the sections on hypothyroidism and on the cardiovascular system in thyrotoxicosis, but on the whole he has accomplished his difficult task admirably. The style is most readable, the evidence is judicially considered, and detail is never allowed to obscure principles.

The production of the book could hardly be bettered. Each chapter concludes with a list of carefully selected references and the index is worthy of the reputation of Mr. A. L. Clarke. The book should bring credit alike to author and publisher, and provides a valuable addition to British surgical literature.

A Guide to Human Parasitology

For Medical Practitioners. By D. B. BLACKLOCK, M.D. Edin., D.P.H. Lond., D.T.M. Liverp., Professor of Parasitology, University of Liverpool; and T. SOUTHWELL, D.Sc., Ph.D., A.R.C.Sc., F.R.S. Edin., Lecturer in Helminthology, School of Tropical Medicine, Liverpool. London: H. K. Lewis and Co., Ltd. 1931. Pp. 271. 15*s*.

THIS work is devoted to the animal parasites causing disease in man. Its modest title is happily chosen and indicates clearly that the work makes no claims to be encyclopædic in character. It is intended rather to set out for the benefit of the student of tropical diseases and of the qualified practitioner resident abroad the methods and essential steps by which a rapid and certain diagnosis may be reached. This question of diagnosis is kept to the fore throughout the book, and was obviously the most important consideration in the minds of the authors. They have provided clear, practical, and concise instructions in procedure; indeed, the only serious criticism which may be levelled at the work is that it tends to err on the side of brevity. Many points which may not be absolutely necessary for reaching a diagnosis, but are nevertheless essential to a true understanding of the parasite, its life-history and its effects on man, have been omitted. This is especially noticeable in the section on the protozoa, which only occupies some 50 pages as against 134 pages on helminths. This allocation of space seems disproportionately small, since under the heading of protozoa such important conditions are dealt with as amœbiasis, sleeping sickness, and American trypanosomiasis, leishmaniasis, both visceral and dermal, and malaria.

The authors lead up to the description of the parasites by giving, first, certain methods of procuring and examining suspected material, including the use of the microscope. A chapter on the spirochætacea follows, in which, it is interesting to note, the names spironema, treponema, and leptospira have been discarded, at least for the present, in favour of the first generic name spirochæta. In the mention of the individual parasites the same sequence has been used in each case: this is a great help to the reader in avoiding confusion. The generic and specific names, with the more important synonyms where any difficulty might arise, are accompanied by a paragraph giving the geographical distribution, and this is followed by a succinct account of the habitat of the parasite in the body of the host. The morphological characters are then detailed, due emphasis being placed on the more important or diagnostic features at all stages. The life-cycle is set out without a multiplicity of detail or recapitulation of divergent theories, and the pathogenicity of each organism is discussed. Finally, under the heading of diagnosis, the routine procedure for establishing the identity of any parasite is described.

At the end of the volume a number of diagrams frequently expressed that red degeneration of a fibroid in pregnancy affords no indication for operation. He had collected two series of hospital cases and found that the eleven patients who had enucleation performed. all went on to full term, while of 31 instances in which no operation was performed, one mother died of peritonitis following hysterectomy two months after delivery, and there were four abortions, one premature labour with death of the fœtus, one macerated child, and four neonatal deaths. In view of these results, of the danger of changes such as those in the specimen described, and also of the possibility of the development of sarcomatous metaplasia or dense adhesions round the tumour, Dr. Brentnall advocated early surgical treatment when red degeneration was diagnosed in pregnancy.

Prof. Leith Murray defined the late stage of red degeneration as chronic necrobiosis. or grey degeneration, and considered that all cases should be allowed to settle down under morphia unless, in spite of this treatment, there was an increase in the degree of toxæmia.

CARCINOMA OF PERINEUM.

Dr. K. V. Bailey showed a specimen of carcinoma of the perineum removed from a patient aged 36, who was single, and had complained of soreness in the perineal region for two months. Examination revealed a deep excavating ulcer of the perineum extending up to, but not actually invading the external sphincter *ani muscle*, with extensive *glandular involvement* in both groins. As a result of extensive treatment comprising three applications of radium, colostomy and excision of the left iliac and both sets of inguinal glands, and finally of excision of the ulcer, the patient had been rendered comfortable. The perineum readily healed by granulation and the glandular areas were being treated with X rays.

EDINBURGH OBSTETRICAL SOCIETY.

At a meeting of this society on Jan. 13th, with Dr. James Young, the President, in the chair, three papers were read bearing on the

Toxæmias of Pregnancy.

Prof. J. M. Munro Kerr (Glasgow) began by pointing out that little material benefit had been derived from the enormous amount of research on the toxæmias of pregnancy during the past thirty years. As Whitridge Williams had said, "it is evident that the cause of eclampsia has not been discovered, and that the peace of mind of all concerned would have been increased had many of the so-called contributors never written, or at least had withheld their contribution long enough to submit them to ordinary self-criticism."

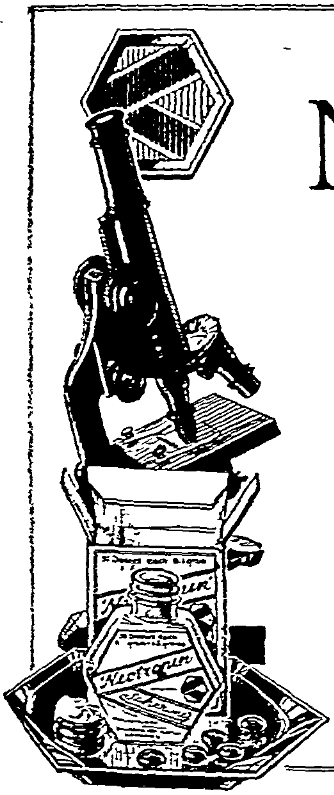
The ætiology of the toxæmias must be looked for not when grave symptoms were present, but far back in the early days of pregnancy when, following the embedding of the zygote, great and insidious forces disturbed the normal physiological processes of the maternal organism. In the first place, there was great activity of all the endocrine glands during pregnancy, especially the *anterior lobe of the pituitary* body and the thyroid. Secondly, there was considerable destruction in the uterine mucosa at the site where the zygote embedded, and later as the placenta grew and developed, the area affected assumed large dimensions. This destruction in the early weeks was very aggressive and the deposition of tissue by the chorionic villi must result in the discharge of products of protein autolysis in the maternal blood stream. In all probability, cases of emesis gravidarum and hyperemesis were due to disturbed *metabolism resulting therefrom*. Thirdly, it had been pointed out by Snorf and Veit that portions of villi were transported by the circulation. The organism may therefore have an additional strain upon it in dealing with such foreign products. Fourthly, metabolism had distinctly altered during the first three months of pregnancy—especially protein metabolism—and although in the human subject there was seldom a definite negative phase such as was seen in the lower animals, something approaching that condition did occur. It was noteworthy that the sickness of pregnancy, the disturbances of the negative phase, and the full development of the placenta occurred about the same time.

These disturbances of the early months were succeeded by a period of relative stability lasting eight to ten weeks during which the grosser manifestations of toxæmia seldom developed, and this was followed by the last phase when outbreaks of toxæmia in one form or another were commonest. The reason for this was probably that the placenta from the sixth month onwards was a degenerating organ and the ectoderm covering the villi had almost disappeared and was more or less degenerating. It seemed inconceivable that an organ in this condition could have any activity as an endocrine organ; thus the placenta was *unlikely to produce* special hormone at this time, but it certainly acted as a store-house for such a substance. Prof. Munro Kerr thought it probable that an outbreak of toxæmia was due to products of protein autolysis; the organism already overburdened by toxins was unable to stand further strain. The pregnant woman had always a struggle to combat attacking forces—endocrine activity, digestion of the endometrium, and the resulting disturbing metabolism. *If she did not* succeed in the fight the toxins produced further infection, more especially in the liver, with the result that metabolic processes were still further affected. Renal disturbances were secondary except where any previous disturbance existed. Faulty elimination followed, and a vicious circle was created which culminated in gross toxæmia in one or other of its recognised forms.

Prof. R. W. Johnstone read a paper on a Fatal Case of presumably Acute Pregnancy Toxæmia which occurred at the seventeenth week of pregnancy and which proved fatal despite drastic operative interference.—Dr. James Davidson described a Fatal Case of Eclampsia associated with extensive cerebral hæmorrhage at the thirty-sixth week of pregnancy.

A Correction.—Dr. A. H. Douthwaite writes in reference to his remarks made at the Medical Society of London last week (p. 350). "I remarked that it was the *hyper*sthenic individual who so often suffered from gall-stones and angina pectoris, and that possibly their coincidence was as much due to the tendency of each condition to arise in the robust type, as to any ætiological connexion between gall-bladder disease and the development of coronary atheroma."

Political Speeches at Mental Hospitals.—A request by a candidate in the Irish Free State General Election for permission to address the attendants at Portrane has been refused by the Grangegorman Mental Hospital Committee on the grounds that "the holding of a meeting within the grounds of the hospital would have an unfavourable effect on the patients." Similar requests in the past have always been refused.



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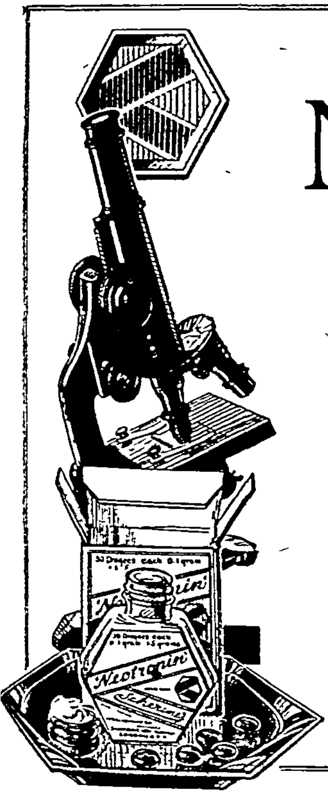

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THE LANCET.

LONDON: SATURDAY, FEBRUARY 20, 1932.

COMMEMORATION CEREMONIES.

The Hunterian Oration, with which this issue of The Lancet opens, is devised on an original plan, and this is noteworthy because over 100 of these addresses have now been delivered, centring round the personality and work of the famous man. Mr. Wilfred Trotter has written no biography whatever; he has taken it for granted that all his audience would know much of the life-history of John Hunter, and be aware of what the world owes to the learning and industry which are exemplified in the wonderful collection, the Hunterian Museum. But he asks pertinently what is the particular fitness of a commemorative oration to Hunter over and beyond the historic monument of the museum which he erected, whose orderly richness has been, and is being, steadily amplified by learned curators. And he supplies the answer, which will be a little unexpected to those who have not previously considered Hunter's work closely, but have been content to accept the estimate of him implied in the familiar cognomen of "the father of English surgery." "It is impossible," says Mr. Trotter, "not to be struck by a certain disproportion between the amount of energy and genius that was expended and the harvest of substantial knowledge that was gathered": in short, the museum, and the clinical and biological labours represented by its formation, do not tell the whole story, and the pious duty remains to supplement it from time to time.

Hunter suffered from the faults of an imperfect education and consequent inability to express himself clearly. Researches undertaken with wonderful imagination and vigour and over an enormous range did not show immediate results. The fundamental nature of the problems which he set himself to solve would anyhow have necessitated the leaving of loose ends; it would have been impossible for him to put Q.E.D. neatly after demonstrations, the objective of which could not always have been clear to himself. This will often be the disability which confronts great imaginers—their genius will be ahead of their accomplishments. In many ways the supreme Leonardo da Vinci resembled John Hunter. Leonardo's imagination was unlimited, and the difficulties which he proposed to solve in the theory and technique of art, in physiology, and in physics concerned the foundations of exact human knowledge. He was ardent and incredibly energetic, but the work which he left behind him was scanty in proportion to his efforts and his genius. And the same may be said of Hunter. Leonardo's remaining masterpieces make a small show materially when compared with the grand museum, but the museum can be regarded, when we remember the state in which it was acquired by the nation, as notes for further work. Hunter, like Leonardo, counts more as the founder of a school of thought than as the performer of accomplished work. For the rôle of pioneer the great Italian, despite the perpetual wars in the middle of which he lived, had this advantage—the Italian courts in the fifteenth century were forcing-houses of art. Very different was it with Hunter, whose period lay, as Mr. Trotter says, when there was little help for him in the general body of science, and when equipment was primitive. He carried on his researches, with only a vague idea of the nature of wound infection, and with no knowledge of histology, in a world largely indifferent to scientific research. But by his example of the way in which experiment must be tested as well as instituted, and in which knowledge must be collated as well as collected, he revolutionised the surgery of the day with enduring consequences. Hunter's own world did not know what he was doing, and it does not seem clear that he knew himself the implications of his huge labours: in his profession he was a practical success—that all men could see; but that he was one of the world's greatest philosophers escaped attention.

Towards the close of the Oration Mr. Trotter shows us the instinctiveness of commemorative rites, as displayed in the feasts of primitive tribes. Always the idea behind the primitive mind has been that by ceremony heroic virtues may be made transferable, and when the cruder methods of accomplishing this had been abandoned, it was natural to attempt to keep up the personality of the dead hero by recalling his virtues on stated occasions. But all will agree to a proposition which Mr. Trotter here puts forward that with the process of time it will be increasingly difficult to separate the commemoration of the dead from the responsibility for their treatment during life, and this will lead to changes in the pious rites. The discoverer is not responsible for the reception of his discoveries. But as the world grows wiser, new ideas cannot be received with the timidity or the opposition which have too often hitherto been their lot. The sifting of wisdom from pretence and of assumption from accomplishment will be within the power of many of the discoverer's contemporaries, and commemorative rites will then record acknowledged triumphs rather than the sadness of neglect.

X RAY PROTECTION.

The British Protection Committee, the first of its kind in any country, had to face formidable difficulties when, in 1921, it undertook the task of formulating recommendations to promote the well-being of the X ray and radium worker. Practically no published data were then available, there was no physical unit of X ray dosage, and the best that could be done was to attempt to correlate on a physical basis the practice of radiologists of standing. The recommendations were framed with

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which are produced in varying degree by high-voltage equipment, and which appear to be definitely toxic.[3] There are, no doubt, many who can cite illustrations of the improved health in X ray workers resulting from improved ventilation conditions. One last point may be made. The growth in power of X ray generators makes it more than ever important to provide earthed guards and shields for high tension circuits. During the past two months alone there have been reported in the press three serious accidents, one fatal, arising from high tension shocks of this kind. This aspect is fully stressed in the revised international recommendations, especial approval being given to equipment which is completely enclosed in earthed conductors. Both the recent Paris and London radiological exhibitions showed illustrations of how such protection can be secured.

To realise the magnitude of the work which the protection committees have succeeded in accomplishing, one has only to cast back to the deplorable conditions which obtained in the average X ray department 20 years ago. There will, however, always be further work for such committees to do, if only in keeping pace with progress, and the British Institute of Radiology marked its sense of the appropriate by concluding its discussion with expressing thanks to the International and British committees for their beneficent work in the past and the hope of like services in the future.

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THE NURSING COMMISSION'S REPORT.

With the publication to-day of a Final Report, The Lancet Commission on Nursing concluded their labours. After 14 months' deliberation on evidence submitted, a representative group of 12 have been able to issue a unanimous report to which many specific recommendations are attached, others being implied in the text. The personnel of the Commission included matrons, physicians, and chairmen of hospitals; it included also an economist, a head-mistress, and others concerned with the careers open to educated women. It is remarkable that a body composed of elements differing so widely in outlook should have found themselves in complete agreement on points of detail as well as of principle. It would be unbecoming for us to praise the Report for its constructive suggestions, or to estimate the extent of the changes that its recommendations may help to bring about. The table of contents and the introduction, set out on p. 415, show the scope of the investigation; the Commission have not confined themselves to the enunciation of principles, but have submitted detailed proposals designed to overcome difficulties. For example, a scheme for the migration of nurses between voluntary and municipal hospitals without loss of pension rights is outlined[4]; the extension of the privilege of State registration to nurses trained in tuberculosis hospitals is shown to be possible without the addition of another Supplementary Part to the Register; a demonstration that nurses do pay indirectly, if not directly, for their training disposes of an assumption to the contrary which has had a far-reaching effect on the economics of the nursing profession. Apart from questions of professional status or economics, the Commission favour a general relaxation of discipline outside working hours, and opportunity, even encouragement, to the hospital nurse to keep up outside interests.

By a coincidence, the result of a survey on nursing education in Canada appeared in the *Montreal Daily Star* on the very day (Jan. 26th) on which the Final Report of The Lancet Commission was signed. The survey has extended over two years under a joint committee of the Canadian Medical Association and the Canadian Nurses' Association. Its terms of reference differ from those of The Lancet Commission, but some of the conclusions arrived at are on parallel lines. It is evident that the problem of combining the theoretical and practical instruction of the student nurse with her routine work, without overtiring her unduly, awaits solution in Canada as in this country. But the problem in Canada is not a shortage but an excess of nurses; one of the most significant of the recommendations made is that until such time as the demand for nurses' services overtakes the supply, hospital authorities "should aim gradually to decrease the number of student nurses by approximately 50 per cent., and to increase their staffs of graduate nurses by about 28 per cent. of the student personnel." The danger of inviting more probationers to take a nurse's training than the profession could absorb, in order to provide our hospitals with student labour, has not been ignored by The Lancet Commission. In view of the shortage of staff nurses and sisters this danger may seem remote at present in England, but in any calling unemployment will result eventually unless the number of apprentices is kept within reasonable bounds. The safeguard is outlined by the Commission—namely, the limitation of the hospitals approved as training centres to those which can provide adequate experience.

Paying Patients at Edinburgh Infirmary.—The committee of the court of contributors of Edinburgh Royal Infirmary reported against the proposal of the board of management to set aside beds for paying patients. At a meeting of the court recently, however, the proposal was supported by 27 votes to 26. One of the chief grounds of opposition was that to charge for treatment would be a departure from the 200-year "ever open door" policy of the Infirmary. Prof. Mackay stated at the meeting that in his experience half the people he had treated could have paid.

Finances of Bristol Hospitals.—A scheme to raise £250,000 in seven years for hospital extension in Bristol has been launched at a citizen's meeting, under the auspices of the Lord Mayor's Hospital Extension Fund. The recommended works are: Providing a new hospital at Winford with 100 beds; reconstructing and enlarging the Eye Hospital; providing additional accommodation at the Royal Infirmary for cancer patients, and extra beds at the General Hospital; adding an out-patient department and new home for nurses to the Children's Hospital; enlarging Winford Orthopædic Hospital; providing sun-balconies, children's wards, altering and enlarging the out-patients' department at the Homœopathic Hospital. Last year 130,000 patients were treated in Bristol Institutions.

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[3] See, for example, Guthmann, H.: Münch. med. Woch., 1922, lx., 53; Hill, L., and Flack, M.: Proc. Roy. Soc., 1911, lxxxiv.B, 404.

[4] See The Lancet, Feb. 13th, p. 374.

regard, on the one hand, to the safety of the operator, and, on the other, to the desire not to cramp progress. The Committee's efforts received the sympathetic coöperation of the British industry, without whose support little could have been effected. There has been no question of legalising these recommendations, but the Ministry of Health, the Ministry of Pensions, the Board of Trade, the Home Office, and H.M. Office of Works, among others, took cognisance of the Committee's work. As time went on, the recommendations needed to be modified here and there in the light of experience. At first protective devices tended to be heavy and clumsy, and excited much criticism on that score, but presently it was realised that these objections could be met by mounting the protective container close to the tube; thus the self-protected X ray tube came into being, its protective value conforming to the British figures. From the outset too the Protection Committee invited and received the coöperation of the National Physical Laboratory which has tested many kinds of protective materials, and has inspected several hundred X ray departments in all parts of the British Isles, thus giving valuable and wide-spread effect to the Committee's work. At Stockholm in 1928 the British recommendations were adopted by the International Congress of Radiology which at the same time set up an International Protection Committee with Dr. G. W. C. KAYE and Dr. S. MELVILLE as honorary secretaries. The effect of this action was profound; for whereas at Stockholm protective devices were scarcely found outside the British section, three years later in Paris they permeated the entire exhibition and had clearly become a world-wide routine.

The international recommendations represent an attempt to embody an ideal. The Committee aimed at main principles and simplicity rather than detail, and the recommendations have come to serve as a connecting link between countries which have formulated national recommendations in greater detail to suit their own requirements. Among these are Austria, Czechoslovakia, Denmark, Germany, Greece, Holland, Hungary, Italy, Norway, Russia, Spain, Sweden, Switzerland, and the United States. In every case the major principles are maintained, some of them are more drastic in detail than the international code, some have been given legal effect. These various national recommendations have recently been collected and compared by the League of Nations Health Organisation in a comprehensive brochure[1] by Dr. H. WINTZ and Dr. W. RUMP, of Erlangen. While little or no recognition is given in this treatise to the pioneer part this country has played, it would be ungenerous not to bestow high praise for its thorough and critical treatment of the main issues. Radiation protection, electrical protection, fire protection, and hygienic measures are discussed, and the inference is unmistakable that the international recommendations are reasonable and practical. Reference is made to the work of medical investigators in different countries who have made estimates of the tolerance dose in terms of the international unit; they are all of the order of 10^{-5} r per second. There is good agreement as to the lead-absorption curve of X rays, making it possible to correlate the tolerance dose with the lead protection proper to different conditions. The results are a close confirmation of the protection figures adopted by both the British and the International Committees. The bibliography of original papers, containing between 500 and 600 references, bears ample testimony to the world-wide interest which the subject has excited.

The international, in common with many of the national, recommendations refer to the value of periodic blood examinations in order to reveal the physical condition of an X ray or radium worker—a precaution fully endorsed at a recent meeting of the British Institute of Radiology. If it could be arranged for the records of such examinations to be collected and digested by some central body, the results would be of great service to the International Committee when they next confer. In the case of radium workers, periodic clinical and blood examinations are regarded as vital by the Radium Commission. There has been a certain amount of misunderstanding as to the degree of protection that the walls of X ray rooms should provide against scattered radiation. The international recommendations make it plain that when a modern self-protected tube is used additional protection on the walls is often not necessary, except perhaps in the region of the operator or in the direction of the beam. If the walls are of 9 in. brick or concrete, the lead equivalent is about 2 mm., which means that normally no additional protection is anywhere necessary. The fact that masonry walls may be adequately protective in themselves is sometimes lost sight of and unnecessary demands for additional protection are occasionally made by radiologists and architects. On the question of ventilation it does not appear always to be realised how moderate is the international recommendation of ten changes of air an hour. The Home Office has published the results of exhaustive inquiries on the subject,[2] the values recommended for various types of occupation ranging from 6 to 30 changes an hour. The value adopted by the International Committee is only half as much again as the figure given as the minimum. As an illustration, the ventilation requirements for a room as large as 25 × 20 × 11 ft. high may be met by the smallest propeller fan normally fitted—namely, one of 12 in. diameter. The outlet however must be in the right place and the inlets big enough and properly distributed. There need then be no draughts, and the fresh air, adequately warmed, of course, will dispel the sense of weariness and lassitude so common in X ray departments. This langour is claimed to be largely associated with the presence of traces of ozone and nitrous fumes, which are produced in varying degree by high-voltage equipment, and which appear to be definitely toxic.[3] There are, no doubt, many who can cite illustrations of the improved health in X ray workers resulting from improved ventilation conditions. *One last point may be made.* The growth in power of X ray generators makes it more than ever important to provide earthed guards and shields for high tension circuits. During the past two months alone there have been reported in the press three serious accidents, one fatal, arising from high tension shocks of this kind. This aspect is fully stressed in the revised international recommendations, especial approval being given to equipment which is completely enclosed in earthed conductors. Both the recent Paris and London radiological exhibitions showed illustrations of how such protection can be secured.

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[1] Protective Measures against Dangers resulting from the Use of Radium, Rontgen and Ultra-violet Rays. Allen and Unwin, Ltd. Pp. 114. 3s.

[2] Ventilation of Factories and Workshops. Welfare Pamphlet 205. 1927. 6d.

To realise the magnitude of the work which the protection committees have succeeded in accomplishing, one has only to cast back to the deplorable conditions which obtained in the average X ray department 20 years ago. There will, however, always be further work for such committees to do, if only in keeping pace with progress, and the British Institute of Radiology marked its sense of the appropriate by concluding its discussion with expressing thanks to the International and British committees for their beneficent work in the past and the hope of like services in the future.

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THE NURSING COMMISSION'S REPORT.

WITH the publication to-day of a Final Report, THE LANCET Commission on Nursing concluded their labours. After 14 months' deliberation on evidence submitted, a representative group of 12 have been able to issue a unanimous report to which many specific recommendations are attached, others being implied in the text. The personnel of the Commission included matrons, physicians, and chairmen of hospitals; it included also an economist, a head-mistress, and others concerned with the careers open to educated women. It is remarkable that a body composed of elements differing so widely in outlook should have found themselves in complete agreement on points of detail as well as of principle. It would be unbecoming for us to praise the Report for its constructive suggestions, or to estimate the extent of the changes that its recommendations may help to bring about. The table of contents and the introduction, set out on p. 415, show the scope of the investigation: the Commission have not confined themselves to the enunciation of principles, but have submitted detailed proposals designed to overcome difficulties. For example, a scheme for the migration of nurses between voluntary and municipal hospitals without loss of pension rights is outlined[4]; the extension of the privilege of State registration to nurses trained in tuberculosis hospitals is shown to be possible without the addition of another Supplementary Part to the Register; a demonstration that nurses do pay indirectly, if not directly, for their training disposes of an assumption to the contrary which has had a far-reaching effect on the economics of the nursing profession. Apart from questions of professional status or economics, the Commission favour a general relaxation of discipline outside working hours, and opportunity, even encouragement, to the hospital nurse to keep up outside interests.

By a coincidence, the result of a survey on nursing education in Canada appeared in the *Montreal Daily Star* on the very day (Jan. 26th) on which the Final Report of THE LANCET Commission was signed. The survey has extended over two years under a joint committee of the Canadian Medical Association and the Canadian Nurses' Association. Its terms of reference differ from those of THE LANCET Commission, but some of the conclusions arrived at are on parallel lines. It is evident that the problem of combining the theoretical and practical instruction of the student nurse with her routine work, without overtiring her unduly, awaits solution in Canada as in this country. But the problem in Canada is not a shortage but an excess of nurses; one of the most significant of the recommendations made is that until such time as the demand for nurses' services overtakes the supply, hospital authorities "should aim gradually to decrease the number of student nurses by approximately 50 per cent., and to increase their staffs of graduate nurses by about 28 per cent. of the student personnel." The danger of inviting more probationers to take a nurse's training than the profession could absorb, in order to provide our hospitals with student labour, has not been ignored by THE LANCET Commission. In view of the shortage of staff nurses and sisters this danger may seem remote at present in England, but in any calling unemployment will result eventually unless the number of apprentices is kept within reasonable bounds. The safeguard is outlined by the Commission—namely, the limitation of the hospitals approved as training centres to those which can provide adequate experience.

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[3] See, for example, Guthmann, H.: Münch. med. Woch., 1922, lxix, [illegible]; Hill, L., and Flack, M.: Proc. Roy. Soc., 1911, lxxxiv.B, [illegible].

[4] See THE LANCET, Feb. 13th, p. 374.

PAYING PATIENTS AT EDINBURGH INFIRMARY.—The committee of the court of contributors of Edinburgh Royal Infirmary reported against the proposal of the board of management to set aside beds for paying patients. At a meeting of the court recently, however, the proposal was supported by 27 votes to 26. One of the chief grounds of opposition was that to charge for treatment would be a departure from the 200-year "ever open door" policy of the Infirmary. Prof. Mackay stated at the meeting that in his experience half the people he had treated could have paid.

FINANCES OF BRISTOL HOSPITALS.—A scheme to raise £250,000 in seven years for hospital extension in Bristol has been launched at a citizen's meeting, under the auspices of the Lord Mayor's Hospital Extension Fund. The recommended works are: Providing a new hospital at Winford with 100 beds; reconstructing and enlarging the Eye Hospital; providing additional accommodation at the Royal Infirmary for cancer patients, and extra beds at the General Hospital; adding an out-patient department and new home for nurses to the Children's Hospital; enlarging Winford Orthopædic Hospital; providing [illegible] wards, altering and enlarging the [illegible] at the Homœopathic Hospital. Last year 130,000 patients were treated in Bristol Institutions.

ANNOTATIONS

ASBESTOS IN LONDON TUBE RAILWAYS.

IF it be true that asbestos fibre was woven into cloth and used in ancient Rome, the medical profession has been negligent in its failure, until quite recently, to detect the existence of chronic industrial pulmonary asbestosis. The first fatal case of pulmonary asbestosis was recorded by H. M. Murray in 1900, and a full account of the disease was given two years ago in our own columns[1] by Dr. W. B. Wood and Dr. S. R. Gloyne. The Home Office inquiry into the effects of asbestos dust on the lungs, published shortly afterwards,[2] has been followed by the adoption of active measures to suppress dust in asbestos factories. In many such factories the introduction of exhaust ventilation and the replacement of dry processes by wet have changed the atmosphere in which the work is carried out until it is now free at least from visible dust. The operation of cleaning the carding machines by steel brushes, undoubtedly a potent source of fatal pulmonary asbestosis, has now been replaced by a vacuum method. In view of the fact that the dust particle producing the lesion in the lung has a diameter of only 2 μ to 10 μ it is obvious that the dust must be suppressed at its source; the use of respirators is futile. Illustrations were recently given in the daily press of an experiment which has been devised to coat the London tubes with asbestos in an attempt to minimise noise. In these illustrations the workman was provided with a double projector, fitted with triggers by which he released from two independent jets a spray of pulverised asbestos, apparently under considerable air pressure, and a spray of some adhesive solution. According to the illustrations the asbestos powder passed through the atmosphere for something like six inches before meeting the stream of adhesive. Though it is true that the workman was provided with a mask, it is equally true that his clothing was covered by asbestos powder. Experience in asbestos factories would indicate that, should the experiment of the London tube railways lead to an extensive use of this method for deadening noise in all the underground railways of London, then a large increase in industrial pulmonary asbestosis may be expected in years to come. In the House of Commons last week (see p. 374) Dr. W. J. O'Donovan asked the Home Secretary if adequate precautions had been taken to prevent fatal lung disease in workers lining London tubes with asbestos. Sir Herbert Samuel replied that he had no powers of control in respect of this work under the Factory or other Acts, and had no information at present as to the precautions taken. But he promised to make inquiries.

HIGH BLOOD PRESSURE AND STROKES.

DESPITE much investigation since Allbutt's original description of high blood pressure there is still doubt about its cause and symptoms, especially in the earlier stages. It is, as a rule, only later on, when the condition is fully developed and grave symptoms have supervened, that patients with hyperpiesis are seen and studied by the specialist. Since by then irreparable damage has been done, it is to earlier recognition and study that we must look for advance in our knowledge. The condition is so common as to be an ideal subject for study by the general practitioner, and in an essay awarded the Sir Charles Hastings clinical prize for 1930, Dr. H. O. Gunewardene[1] records observations and conclusions on the "sudden severe attacks" affecting the nervous system that are met with in this disorder. He finds that minor paralytic and sensory phenomena are more common than the major apoplectic fit associated with a severe cerebral hæmorrhage. These minor attacks may be either permanent or transient, and their duration is sometimes only a matter of minutes or hours. In distribution they may be hemiplegic, monoplegic, or localised to one part such as the ey or tongue. The sensory phenomena are similar t the motor in distribution, and take such form as paræsthesia, numbness, pain or blindness Dr. Gunewardene finds that severe cerebral hæmorrhage is rare in patients whose diastolic pressure i less than 135, whereas the less severe strokes occu with diastolic pressures of between 115 and 125, n case being seen with a diastolic pressure less than 11 His observations also show that cerebral hæmorrhag is unusual in patients under observation who hav been warned to lead a quiet and restricted lif whereas fatal hæmorrhage is likely in patien carrying on their normal occupation and making n allowance for their hypertension. He also mak it clear that both fatal cerebral hæmorrhage an transient strokes are very uncommon once cardi failure has begun or there is clinical evidence cardiac enlargement.

RESULTS OF GASTRECTOMY FOR CANCER

IN a communication[2] to the Academy of Medici on Jan. 19th, Prof. H. Hartmann reviewed the la results in 125 cases of gastrectomy for cancer of t stomach, observed for periods ranging up to years. Of the 25 patients who showed no sign relapse, all but one had been under observati since the operation for periods varying between 1 a 27 years. There were, further, seven patients w had died, but not of cancer, and these deaths h occurred from 3 to 19 years after the operati Another group included 13 patients, the cause whose death from 2 to 13 years after the operat was not known; there may, perhaps, have b some deaths from recurrence of the disease am these 13. Lastly, there were 80 patients, wh death was due to recurrence of the disease, in cases during the first year, in 35 during the seco in 8 during the third, and in 6 during the fou year after the operation. Altogether 39 patie (or 31 per cent.) survived the operation by three ye or more, and Prof. Hartmann is inclined to put 29 or 30 per cent. the proportion of his patients whom a cure could be claimed. He has achie this comparatively successful result, not so much sacrificing the greater part of the stomach, as removing with the greatest care the groups of gla which are most subject to invasion. He arg that even better results would certainly follow ear diagnoses and operations performed before the dise had extended beyond the first relay of glan His conclusion that "le cancer de l'estomac est bon cancer au point de vue opératoire" is m encouraging. His communication would, however, have been still more interesting had he stated how many other cases of cancer of the stomach he had observed in the same period and had not operated on for some reason or other. In the discussion following this communication, Prof. Chauffard gave support to his scepticism as to operative cure of cancer in general by recording the case of a woman who died at the age of 92, when cancer developed in the scar of an operation for cancer of the left breast more than 50 years earlier. Had she died at the age of 91, she would have been cited as an irrefutable case of cure of cancer by operation. This point is, perhaps, of academic rather than practical interest; most patients operated on for cancer would not be greatly perturbed by the prospect of the disease recurring 50 years later.

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[1] THE LANCET, 1930, i., 445.

[2] Report on Effects of Asbestos Dust on the Lungs and Dust Suppression in the Asbestos Industry; Merewether, E. R. A., and Price, C. W., 1930. London: H.M. Stat. Office. See THE LANCET, 1930, i., 870.

[1] Brit. Med. Jour., Jan. 30th, p. 180.

[2] Bull. de l'Acad. de Méd., cvii., No. 3.

PHYSIOLOGY OF WEEPING

It is well known, at any rate by mothers, that infants do not shed tears until they are several weeks, or in some cases months, old. Darwin observed the fact and comments on it in his book on "The Expression of the Emotions in Man and Animals." Mr. Treacher Collins, in a recent article,[1] explains that this is not because the lacrymal glands are not developed at birth but because weeping is not a reflex action in the ordinary sense, but rather a conditional reflex analogous to the secretion of the salivary gland that may be excited by the sight or even the thought of food. Weeping, in fact, is a late physiological development, both in the individual and in the race. In spite of legends about elephants or crocodiles, it seems to be established that no animals except man do actually shed tears. Mr. Lindsay Johnson experimented on crocodiles by squeezing the juice of an onion mixed with common salt into their eyes but obtained no confirmation of the myth. The physiological importance of the lacrymal secretion in man is in the first place that it keeps the surface of the cornea well lubricated and free from minute particles of dust, and in the second place that its most important constituent, lysozyme, acts as a very efficient bactericide. This is the function, not of the excessive secretion known as weeping, but of the ordinary constant secretion which may be increased by reflex action following upon any irritation to the cornea. So important does Mr. Collins consider it that he suggests that the immunity of infants from ophthalmia neonatorum in whom Credé's treatment has been employed at birth is more probably due to the lysozyme in the lacrymal secretion than to any germicidal property in the very dilute solution of nitrate of silver employed. For although the lacrymal glands of the young infant do not react psychically they do react reflexly to any ordinary stimulus and the instillation of drops acts as such. Mr. Collins goes on to consider the other protective mechanisms of the eye and especially the firm closure of the lids which is often associated with weeping. This is effected by the orbicularis oculi muscle and especially by certain fibres of it situated near the conjunctival surface of the lid and known as the "muscle of Riolan," which are found to be much more highly developed in man than in any other mammal. The effect of tight closure of the lids is to protect the ocular blood-vessels from the effect of any sudden increase of blood pressure due to extraordinary expiratory efforts with a closed glottis. It is Nature's corrective to the sudden suffusion of the blood-vessels of the eye which attends any violent muscular effort, especially if the jugular veins are at the same time compressed by a tight collar. In this connexion, Mr. Collins mentions the relief that may sometimes be given to a tendency to subconjunctival hæmorrhages by changing the habit of wearing tight collars, also the rationale of bandaging the eyes after any eye operation involving an opening into the globe.

ASPHYXIA NEONATORUM.

THE methods of peripheral stimulation formerly employed to encourage respiration in the newly born—such as smacking, pinching, and cold-tubbing—have now been abandoned because it is realised that the necessary stimulus is almost certainly chemical rather than physical. But it is still by no means certain exactly what this stimulus may be. Many have held that an increased carbon dioxide tension of the blood reaching the respiratory centre is the operative factor, and on the analogy of the successful use of carbon dioxide in the treatment of carbon monoxide poisoning (where the tension of both CO_2 and oxygen in the blood is low) Yandell Henderson has consistently and eloquently pleaded the value of CO_2 in stimulating respiration in the newly born. From an extensive study of the fœtal blood, however, N. J. Eastman[1] now calls the rationale of this method of treatment in question. He finds that in asphyxiated infants the blood shows a greatly increased CO_2 tension and a serum pH reduced to the lower limits compatible with life, and he argues that the administration of CO_2 to stimulate respiration in such cases is not only valueless but actually harmful. He regards the primary blood chemical change as a reduction in the oxygen content of the fœtal blood, and emphasises that the chief therapeutic indication is therefore for oxygen. Of the simpler methods of filling the lungs with air, manual artificial respiration and mouth-to-mouth insufflation are those most readily available; it should be recognised, however, that neither is without danger, since ribs may easily be fractured by rough handling and the lung or stomach ruptured by too vigorous insufflation. Oxygen may also be given directly by mask or nasal catheter, and probably the ideal method would be a combination of the former with artificial respiration carried out by a Drinker respirator, which was described in THE LANCET last year (1931, i., 1186).

ERYTHEMA NODOSUM.

THE causation of erythema nodosum has long perplexed students of the disease, the main views on its origin at the moment falling into three groups. First there is the theory of those who, impressed by the association with tuberculosis which has been noticed by many workers, particularly in Scandinavia, regard the eruption of erythema nodosum as the exanthem of tuberculosis. Then there are those who, while recognising the association between tuberculosis and erythema nodosum, realise that this association is by no means constant and are therefore led to believe that the disease is an acute specific fever—"nodal fever." Finally, there are those who look on erythema nodosum as an allergic manifestation which may occur in allergic states due to various sensitising agents. Its association with tuberculosis they explain by the fact that the tubercle bacillus is a common allergen, as evidenced by the frequency with which a positive tuberculin reaction is found amongst the general population. Dr. W. R. F. Collis[1] has recently produced strong evidence in support of this view. In a study of eight children suffering with erythema nodosum, five were found to be definitely tuberculous by history, clinical findings, positive Mantoux test, and in three cases by the discovery of tubercle bacilli in the stomach wash-out. The remaining three cases however presented no evidence of tuberculosis and the Mantoux test was negative in all. But these three cases gave a strongly positive reaction to an intradermal injection of hæmolytic streptococcal endotoxin, a reaction which closely resembled the nodes of erythema nodosum itself. These three cases followed acute streptococcal sore-throats in from 5 to 20 days. Dr. Collis's work makes it clear that erythema nodosum is neither a specific disease nor invariably tuberculous in origin, but that the eruption is the result of the action of the soluble products of certain organisms on tissues already hypersensitive. It is thus possible that it may occur in other infections besides those due to the tubercle bacillus and hæmolytic streptococci.

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[1] Brit. Jour. of Ophthalmology, Jan., 1932, p. 1.

[1] Bull. Johns Hopkins Hosp., January, 1932, p. 39.

THE SCHÜLLER-CHRISTIAN SYNDROME.

THE association of growths in the membrane bones of the cranium with diabetes insipidus and exophthalmos was first ascribed to some form of dyspituitrism, but of recent years the tendency has been to place it in the group of general metabolic disorders. In this group there are already such maladies as Gaucher's disease in which the chemical disturbance appears to affect kerasin, the Niemann-Pick disease in which phosphatide is incriminated, and perhaps here should be included a curious form of hepatic enlargement associated with excessive deposition of glycogen as described by Gierke.[2] In a recent account[3] of an example of the Schüller-Christian syndrome by Dr. R. Attig of the University Children's Clinic in Berlin, the author refers briefly to these other defective storage diseases before proceeding to describe his case under the title of generalised xanthomatosis, cholesterol being cited as the chemical substance affected in this condition. The patient was a boy of 3½ years who had been perfectly well until a year previously when he fell out of bed and three weeks later developed a tumour in the neighbourhood of the left temple with protrusion of the left eyeball. The exophthalmos became less in the next few weeks but the bony tumour remained stationary. Shortly afterwards the boy was noticed to be limping with his left leg and about a year later a swelling appeared at the root of the nose which led to his coming under hospital observation. Swellings were found on the skull in several situations and radiological examination showed the curious areas of defective bone described by Christian as giving a moth-eaten appearance to the picture and by Attig as being like a map. Changes were also found in the left iliac bone. The blood cholesterol was raised to 244 mg. per 100 c.cm. and on the skin of the back between the shoulder-blades there were numerous small papules of varying size and of a reddish-brown colour. The swelling in the neighbourhood of the glabella was punctured without result and a small piece was removed for section. It was of a definitely yellow tint and on examination showed the large foam-cells, characteristic of the disease, which contained a substance doubly refractive to polarised light. The histological examination indicated that the tumour was a xanthoma. While the child was in hospital the tumours in the scalp got bigger while the skin condition became more widespread and numerous punctiform hæmorrhages also appeared in the skin. Death occurred four months after admission and post-mortem examination confirmed the xanthomatous nature of the changes in the flat bones (skull and ilium), the long bones being free. The exophthalmos present at the onset of the disorder was found to have been due to a xanthoma of the dura mater. The lymphatic glands throughout the body contained numerous hæmorrhages. The cause of the condition is unknown, although trauma is not infrequent in the history of the onset, as in the case here described. The affection of the flat bones, the onset in a child about two years of age, the skin changes and the exophthalmos, all characteristic of the Schüller-Christian disease, were present in this case; but the curious association with diabetes insipidus, present in some of the published cases, was absent, probably because there were no marked changes in the bones in the region of the sella turcica.

ANOTHER VIEW OF ARTERIO-SCLEROSIS.

ARTERIO-SCLEROSIS has certainly not been neglected by clinicians and experimenters, but it is still an obscure condition. Any thoughtful work on it is therefore welcome, and it is all to the good that Prof. Plesch, in the paper printed elsewhere in this issue, makes suggestions that will not be generally accepted at first sight. It seems to be agreed that arterio-sclerosis, or athero-sclerosis, is a manifestation of a general systemic disease, but the stages leading up to it are not established, and it is on this point that Plesch has definite theories. He advances the view that athero-sclerosis is a healing process in tha it serves no other purpose than to raise the resistance of the walls of already damaged vessels at points o stress or strain, the muscular and elastic elements of the walls of the blood-vessels being previously weakened by an atonic state of the vessel. He sets out to prove his thesis by experimental work, together with clinical and pathological investigations. By a process which he himself has perfected he has injected the coronary arteries, and remarks on the irregularity of their calibre as a result of dilatation; in this connexion it is of interest to note that ophthalmic surgeons rely more on the irregularity of calibre of the retinal vessels as indicating vascular disease than on any other sign found in the fundus. If Plesch's theories are correct he will provide us with an explanation of the failure clinically of drastic lowering of the blood pressure or constant use of vasodilators in the treatment of high blood pressure.

There are many who will disagree with Prof. Plesch when he says that most athletes die before they are 50 years of age, and that they are seldom capable of great physical exertion when they attain middle-life. Possibly this statement needs qualifying, and he is no doubt referring to those who give their whole time to athletics, and not to those who take part in sport merely as a recreation. Much work has been done on the effect of exercise on blood pressure, and it is pretty generally agreed that exercise raises the systolic pressure considerably, and the diastolic to a less extent, thus increasing the pulse pressure; the systolic pressure remains high for a considerable time after the exercise is finished, and slowly returns to normal. This is not considered injurious, and Paul White, in his book on "Heart Disease," says that recent studies indicate that athletes do not suffer early disability or death because of their exercise in youth; even veteran Marathon runners have not shown enough hypertrophy of the heart to be evident on radiographic examination. When such conflicting views are expressed, it seems necessary to have more precise knowledge on this important subject, more especially as athletics are playing an increasingly important part in everyday life.

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[1] Quart. Jour. Med., January, 1932, p. 141.
[2] Zieglers Beitr. z. Path. Anat., 1929, lxxxii., 497.
[3] Jahrb. f. Kinderh., 1932, cxxxiv., 196.

DRAUGHTS AND COLDS.

King Alfred, so Chesterton informs us, "fought as gravely as a good child at play"; and it is in a similar spirit that C.-E. A. Winslow and Leonard Greenburg have approached the study of Vasomotor Reactions to Localised Drafts.[1] Their inquiry was undertaken "to determine the changes in distribution of the superficial blood-supply resulting from localised drafts, with special view to the possible effects of these changes upon the condition of the upper respiratory tract." There is certainly precedent for this endeavour, and they are able to give an impressive list of workers who have already investigated the truth of the popular belief that one can catch cold by sitting in a draught. Leonard Hill and F. F. Muecke,[2] it appears, using the method of direct observation with a nasal speculum, were the first to report the fact that in a warm atmosphere the mucous membrane of the nose became moist and hyperæmic, and in a cold atmosphere contracted and ischæmic; on sudden chilling, however, the membranes were often found to remain swollen but ischæmic. It is this abnormal condition where the swollen, spongy tissue lacks the protective effect of an ample blood-supply, which is thought to favour bacterial invasion.

Winslow and Greenburg have adopted elaborate methods to decide whether localised draughts play a more definite part than generalised chilling in the ætiology of respiratory infection. Seven different subjects, students of Yale University, submitted to a total of 26 experiments. Low temperatures were secured, in the room used for experiment, by opening the windows and turning off the radiators on the preceding night, and high temperatures by turning on the radiators and closing the windows. The experiments were performed with the windows closed to ensure known conditions within the room. On entering in the morning, the subject stripped himself and lay on a cot for 45 to 60 minutes, after which the following observations were made: the dry and wet-bulb temperature of the atmosphere; the cooling power of the atmosphere by the kata-thermometer; Glatzel mirror observation on the nose of the subject; visual observation of the swelling, redness and moisture of the nose and throat; pulse, respiration, and blood pressure; skin temperature on the surface of the body, and temperature observations on the nose and throat. He was invited to say whether he was comfortable or not. Temperatures were taken at five points in the oral and nasal cavities and at 17 points on the outer skin, and were measured by the thermoelectric method. When these observations were complete a yoke of beaver board partition was used to isolate the subject's head or feet, and the extremity chosen was then exposed to a draught of air from an electric fan for a period of 30 to 50 minutes; the previous observations were then repeated, with the difference that the temperature and kata-thermometer readings were taken both in the vicinity of the body and of the isolated extremity. The draught was then discontinued, and after a period of 5 to 50 minutes the complete series of observations was once more repeated.

The results of the inquiry confirmed those of other workers in showing that chilling of the body surface leads to contraction, ischæmia, and dryness of the mucous membranes of the nose; but there was nothing to indicate that localised, as opposed to general, draughts had any special influence on respiratory infection. Only one of the subjects developed a cold during the experiments. On this occasion, therefore, tradition appears to have been routed. But those who think they can produce immediate rhinorrhœa by walking barefoot on cold floors may still feel a little dissatisfied with the evidence against them.

STEENSEN.

THE Copenhagen Medical Society, taking, we learn, as their model the British habit, have decided to honour prominent men of medicine by instituting commemorative ceremonies, and as a commencement an Oration has been founded in honour of Niels Steensen, more familiar to us as Stensen or Steno, the discoverer of Steno's duct. In Holland as well as in Denmark the great physiologist is known by his Danish name Steensen. The first Steensen Oration was delivered on Jan. 11th by Dr. V. Meisen, well known for his surgical work on varicose veins and hæmorrhoids, an ardent student of medical history, and the translator recently into Danish of Harvey's de Motu Cordis. Steensen's life, as set out by Dr. Meisen, is of great psychological interest. He discovered in 1660 the excretory duct of the parotid, when he was only 22 years old, and was studying in Amsterdam. This was the commencement of an unfortunately short career as a physiologist, but during the next 14 years he showed himself a brilliant investigator; Michael Foster has referred with appreciation to his researches into the physiology of the muscles, of various glands, and of the brain, while Dr. Meisen stated in his address that Steensen was the first to show that the heart was "a muscle and nothing else." He says of the work on the lacrymal glands, that "it explained their structure, working, and functions; maintaining that the ducts were the outlet of the tears, the normal function of which was to keep the surface of the eye and eyelids smooth, and that the passage was only insufficient when the lacrymal fluid was secreted in excessive abundance." In fact Steensen disposed of the accepted belief that the tears emanated directly from by the frequency with which a positive tuberculin reaction is found amongst the general population. Dr. W. R. F. Collis[1] has recently produced strong evidence in support of this view. In a study of eight children suffering with erythema nodosum, five were found to be definitely tuberculous by history, clinical findings, positive Mantoux test, and in three cases by the discovery of tubercle bacilli in the stomach wash-out. The remaining three cases however presented no evidence of tuberculosis and the Mantoux test was negative in all. But these three cases gave a strongly positive reaction to an intradermal injection of hæmolytic streptococcal endotoxin, a reaction which closely resembled the nodes of erythema nodosum itself. These three cases followed acute streptococcal sore-throats in from 5 to 20 days. Dr. Collis's work makes it clear that erythema nodosum is neither a specific disease nor invariably tuberculous in origin, but that the eruption is the result of the action of the soluble products of certain organisms on tissues already hypersensitive. It is thus possible that it may occur in other infections besides those due to the tubercle bacillus and hæmolytic streptococci.

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[1] Amer. Jour. of Hyg., January, 1932, p. 1.

[2] THE LANCET, 1913, i., 1291.

THE SCHÜLLER-CHRISTIAN SYNDROME.

THE association of growths in the membrane bones of the cranium with diabetes insipidus and exophthalmos was first ascribed to some form of dyspituitrism, but of recent years the tendency has been to place it in the group of general metabolic disorders. In this group there are already such maladies as Gaucher's disease in which the chemical disturbance appears to affect kerasin, the Niemann-Pick disease in which phosphatide is incriminated, and perhaps here should be included a curious form of hepatic enlargement associated with excessive deposition of glycogen as described by Gierke.[2] In a recent account[3] of an example of the Schüller-Christian syndrome by Dr. R. Attig of the University Children's Clinic in Berlin, the author refers briefly to these other defective storage diseases before proceeding to describe his case under the title of generalised xanthomatosis, cholesterol being cited as the chemical substance affected in this condition. The patient was a boy of 3½ years who had been perfectly well until a year previously when he fell out of bed and three weeks later developed a tumour in the neighbourhood of the left temple with protrusion of the left eyeball. The exophthalmos became less in the next few weeks but the bony tumour remained stationary. Shortly afterwards the boy was noticed to be limping with his left leg and about a year later a swelling appeared at the root of the nose which led to his coming under hospital observation. Swellings were found on the skull in several situations and radiological examination showed the curious areas of defective bone described by Christian as giving a moth-eaten appearance to the picture and by Attig as being like a map. Changes were also found in the left iliac bone. The blood cholesterol was raised to 244 mg. per 100 c.cm. and on the skin of the back between the shoulder-blades there were numerous small papules of varying size and of a reddish-brown colour. The swelling in the neighbourhood of the glabella was punctured without result and a small piece was removed for section. It was of a definitely yellow tint and on examination showed the large foam-cells, characteristic of the disease, which contained a substance doubly refractive to polarised light. The histological examination indicated that the tumour was a xanthoma. While the child was in hospital the tumours in the scalp got bigger while the skin condition became more widespread and numerous punctiform hæmorrhages also appeared in the skin. Death occurred four months after admission and post-mortem examination confirmed the xanthomatous nature of the changes in the flat bones (skull and ilium), the long bones being free. The exophthalmos present at the onset of the disorder was found to have been due to a xanthoma of the dura mater. The lymphatic glands throughout the body contained numerous hæmorrhages. The cause of the condition is unknown, although trauma is not infrequent in the history of the onset, as in the case here described. The affection of the flat bones, the onset in a child about two years of age, the skin changes and the exophthalmos, all characteristic of the Schüller-Christian disease, were present in this case; but the curious association with diabetes insipidus, present in some of the published cases, was absent, probably because there were no marked changes in the bones in the region of the sella turcica.

ANOTHER VIEW OF ARTERIO-SCLEROSIS.

ARTERIO-SCLEROSIS has certainly not been neglected by clinicians and experimenters, but it is still an obscure condition. Any thoughtful work on it is therefore welcome, and it is all to the good that Prof. Plesch, in the paper printed elsewhere in this issue, makes suggestions that will not be generally accepted at first sight. It seems to be agreed that arterio-sclerosis, or athero-sclerosis, is a manifestation of a general systemic disease, but the stages leading up to it are not established, and it is on this point that Plesch has definite theories. He advances the view that athero-sclerosis is a healing process in that it serves no other purpose than to raise the resistance of the walls of already damaged vessels at points of stress or strain, the muscular and elastic elements of the walls of the blood-vessels being previously weakened by an atonic state of the vessel. He sets out to prove his thesis by experimental work together with clinical and pathological investigations. By a process which he himself has perfected he has injected the coronary arteries, and remarks on the irregularity of their calibre as a result of dilatation; in this connexion it is of interest to note that ophthalmic surgeons rely more on the irregularity of calibre of the retinal vessels as indicating vascular disease than on any other sign found in the fundus. If Plesch's theories are correct he will provide us with an explanation of the failure clinically of drastic lowering of the blood pressure or constant use of vasodilators in the treatment of high blood pressure.

There are many who will disagree with Prof. Plesch when he says that most athletes die before they are 50 years of age, and that they are seldom capable of great physical exertion when they attain middle-life. Possibly this statement needs qualifying, and he is no doubt referring to those who give their whole time to athletics, and not to those who take part in sport merely as a recreation. Much work has been done on the effect of exercise on blood pressure, and it is pretty generally agreed that exercise raises the systolic pressure considerably, and the diastolic to a less extent, thus increasing the pulse pressure; the systolic pressure remains high or a considerable time after the exercise is finished, and slowly returns to normal. This is not considered injurious, and Paul White, in his book on "Heart Disease," says that recent studies indicate that athletes do not suffer early disability or death because of their exercise in youth; even veteran Marathon runners have not shown enough hypertrophy of the heart to be evident on radiographic examination. When such conflicting views are expressed, it seems necessary to have more precise knowledge on this important subject, more especially as athletics are playing an increasingly important part in everyday life.

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[1] Quart. Jour. Med., January, 1932, p. 141.
[2] Zieglers Beitr. z. Path. Anat., 1929, lxxxii., 497.
[3] Jahrb. f. Kinderh., 1932, cxxxiv., 196.

DRAUGHTS AND COLDS.

King Alfred, so Chesterton informs us, "fought as gravely as a good child at play"; and it is in a similar spirit that C.-E. A. Winslow and Leonard Greenburg have approached the study of Vasomotor Reactions to Localised Drafts.[1] Their inquiry was undertaken "to determine the changes in distribution of the superficial blood-supply resulting from localised drafts, with special view to the possible effects of these changes upon the condition of the upper respiratory tract." There is certainly precedent for this endeavour, and they are able to give an impressive list of workers who have already investigated the truth of the popular belief that one can catch cold by sitting in a draught. Leonard Hill and F. F. Muecke,[2] it appears, using the method of direct observation with a nasal speculum, were the first to report the fact that in a warm atmosphere the mucous membrane of the nose became moist and hyperæmic, and in a cold atmosphere contracted and ischæmic; on sudden chilling, however, the membranes were often found to remain swollen but ischæmic. It is this abnormal condition where the swollen, spongy tissue lacks the protective effect of an ample blood-supply, which is thought to favour bacterial invasion.

Winslow and Greenburg have adopted elaborate methods to decide whether localised draughts play a more definite part than generalised chilling in the ætiology of respiratory infection. Seven different subjects, students of Yale University, submitted to a total of 26 experiments. Low temperatures were secured, in the room used for experiment, by opening the windows and turning off the radiators on the preceding night, and high temperatures by turning on the radiators and closing the windows. The experiments were performed with the windows closed to ensure known conditions within the room. On entering in the morning, the subject stripped himself and lay on a cot for 45 to 60 minutes, after which the following observations were made: the dry and wet-bulb temperature of the atmosphere; the cooling power of the atmosphere by the kata-thermometer; Glatzel mirror observation on the nose of the subject; visual observation of the swelling, redness and moisture of the nose and throat; pulse, respiration, and blood pressure; skin temperature on the surface of the body, and temperature observations on the nose and throat. He was invited to say whether he was comfortable or not. Temperatures were taken at five points in the oral and nasal cavities and at 17 points on the outer skin, and were measured by the thermoelectric method. When these observations were complete a yoke of beaver board partition was used to isolate the subject's head or feet, and the extremity chosen was then exposed to a draught of air from an electric fan for a period of 30 to 50 minutes; the previous observations were then repeated, with the difference that the temperature and kata-thermometer readings were taken both in the vicinity of the body and of the isolated extremity. The draught was then discontinued, and after a period of 5 to 50 minutes the complete series of observations was once more repeated.

The results of the inquiry confirmed those of other workers in showing that chilling of the body surface leads to contraction, ischæmia, and dryness of the mucous membranes of the nose; but there was nothing to indicate that localised, as opposed to general, draughts had any special influence on respiratory infection. Only one of the subjects developed a cold during the experiments. On this occasion, therefore, tradition appears to have been routed. But those who think they can produce immediate rhinorrhœa by walking barefoot on cold floors may still feel a little dissatisfied with the evidence against them.

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the brain. His work in relation to the functions of the mammæ and the ovaries was equally new and direct, while, before de Graaf, he maintained that the "testes muliebres" were ovaries, and demonstrated the yolk-sac and vitelline duct in a shark. Of his work on the brain, which contained much acute criticism of the knowledge and theories of the day, Dr. Meisen said: "One of his best known contributions to science is his lecture on the anatomy of the brain, delivered in French at Paris in 1664, where he begins in this startling way: 'Gentlemen. Instead of promising You to still your curiosity regarding the anatomy of the brain I have to confess to You my sincere opinion that I do not know anything about it.' . . . He then undertook—as Edward W. Adams[1] says—'the Socratic task of convincing the anatomical world of ignorance.' I quote one passage, which, like many other detached remarks or by-the-way sayings in his writings, has an address even to us in our times: 'To make the necessary inquiries for the discovery of truth a man's whole time must be taken up. . . . Physicians and surgeons cannot comply with this, because of their practise, nor professors because of their public demonstrations. Whole years may sometimes be necessary to discover what may afterwards be demonstrated to others in an hour.' The net effect of Steensen's studies was to correct the views of Willis, who located memory in the cortical substance, imagination in the corpus callosum, and common sense in the striate bodies."

Dr. Meisen proceeded to refer to researches made by Steensen in Italy and Malta into geology, a science to whose pursuit he was led by the dissection of the head of a dog-fish, the teeth of which indicated to him that the glossopetræ of Tuscany were in reality fossil teeth. His treatise "De Solido intra Solidum" is a pioneer work on geologic formation; it is a very rare book, but there are copies in the royal libraries of Copenhagen and in the British Museum, and it was translated into English in 1671. While engaged on this work in Italy he was summoned back to Copenhagen to take up the professorship of anatomy, but he held that office for only two years, for already theological leanings acquired during his Italian sojourn had become predominant. Accordingly, at the age of 36 he returned to Italy, and under the patronage of the Grand Duke of Tuscany, at whose court he lived, his scientific works were published, while the author went over to the Catholic faith, became absorbed in the teachings of the Church, and was eventually appointed to an episcopy in North Germany. He died in 1686, his death, Dr. Meisen suggests, being hastened by the rigorous manner of life which he imposed on himself out of piety, and is buried in Florence, a bust being placed over his tomb in the Basilica San Lorenzo in 1883.

Dr. Meisen closed his Oration by pointing out that in Steensen's time the classic authors and the Old Testament constituted the scientific basis of investigation, most of the scientific discoveries being made by men who were first of all scholars, as was Harvey. Steensen in particular was an ardent student of mathematics, the mathematical sense and the vigorous imagination being remarkably blended in him, as they were in Pasteur whom he resembles both in powers of intuition and boldness of conclusions. Comparing Steensen's work with that of his friend, and comrade, Malpighi, Dr. Meisen says: "It must always be remembered that Malpighi possessed that quite new instrument the microscope which enabled him to find gold where others could not, while he had a working life of 30 years and Steensen one of only 14 years." Certainly the orator justified the description of the Danish savant given by Michael Foster—"a singular man who 300 years ago pierced into questions which are still moving us at the present day."

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[1] Adams in Medical Library and Historical Journal, 1904, vol. II., No. 1.

A MORE SENSITIVE WASSERMANN TEST.

At an early stage of its career the Medical Research Council appreciated that everything should be done to bring about the adoption of a thoroughly reliabl Wassermann test. A series of observations (Specia Reports Series Nos. 14, 21, and 78) were carried out by workers in this country, the result of which wa to show that a properly standardised Wasserman test possessed a very high degree of specificit Recently the introduction of certain precipitin tests in particular the Kahn test in America, suggested i certain circles that the Wassermann test was no all that it should be, both in regard to sensitivit and to specificity. But at the recent Laborator Conference on the sero-diagnosis of syphilis, held a Copenhagen in 1928 under the health organisatio of the League of Nations, it was shown that th Wassermann test as carried out in this country ha nothing to fear in comparison with any of the flocc lation tests, and that the Wassermann test had high, if not higher, qualities of specificity than an test yet devised for syphilis. It had, however, bee felt that in the ordinary standardised Wasserman test, as used in this country, a few cases might ha been missed; in other words, that the test might more sensitive if that could be arranged witho losing any of its high specificity. Several attemp have been made to increase the sensitivity of t Wassermann test by such things as fixation in t cold, decrease in the amount of complement, a changes in the antigen proportion, without apparent any very great success. It is therefore very intere ing to see that Dr. Wyler has pursued this matt further[1] and, as an outcome of his investigatio has devised a method which he considers has increas the sensitivity of the Wassermann test by somethi like 20 per cent. The procedure he adopts is sim to double the quantity of the patient's serum in t test as ordinarily used. This, as he says, is of cou no new principle; it is, for instance, used in carryi out the reaction with cerebral spinal fluid. Perha this is an admission on Dr. Wyler's part that satisfactory quantitative Wassermann test can carried out by using varying quantities of patien serum. Using increased amounts of sera, Dr. Wy has done a series of tests on 1000 sera, over 400 which were from known cases of syphilis. Compa tive tests were carried out against the ordina Wassermann and against the Sigma test, and it see that the test with the newer technique is definite more sensitive than either. Confirmation of the findings will greatly enhance the reliance which placed in this country on the Wassermann te Dr. Wyler is to be congratulated on the lucidity wi which he has put forward his data.

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[1] A Method of Increasing the Sensitiveness of the Wasserma Test. By E. J. Wyler, M.C., M.D. Lond.; Ministry of Heal Reports on *Public Health and Medical Subjects*, No. 67. H. Stationery Office. 1932. Pp. 15. *1d.*

MANCHESTER VICTORIA MEMORIAL JEWISH HOSPITAL.—It has been decided that in future the visiting hours shall be in the evening, on the ground of convenience for the working-classes.

SPECIAL ARTICLES

THE LANCET COMMISSION ON NURSING.

THE Final Report of THE LANCET Commission on Nursing was issued to-day.[1] It will be remembered hat the Commission was appointed in December, 930, to inquire into the reasons for the shortage of andidates, trained and untrained, for nursing the ick in general and special hospitals throughout the country, and to offer suggestions for making the ervice more attractive to women suitable for this necessary work. The members of the Commission were:—

The Earl of CRAWFORD and BALCARRES. P.C., K.T., F.R.S. (Chairman).

Miss M. D. BROCK. O.B.E., M.A., Litt.D., Headmistress, the Mary Datchelor Girls' School.

Miss L. CLARK, M.B.E., R.R.C., Matron, Whipps Cross Hospital.

Prof. HENRY CLAY, M.A., D.Sc., late Professor of Social Economics in the University of Manchester.

Miss R. E. DARBYSHIRE, R.R.C., Matron, University College Hospital.

Prof. F. R. FRASER, M.D., F.R.C.P., Professor of Medicine in the University of London, Physician to St. Bartholomew's Hospital.

Mr. A. LISTER HARRISON, J.P., Chairman. Committee of Management, Metropolitan Hospital.

Dr. ROBERT HUTCHISON, F.R.C.P., Physician to the London Hospital and to the Hospital for Sick Children, Great Ormond-street.

Mrs. OLIVER STRACHEY, Chairman, Employment Committee, London and National Society for Women's Service.

Miss EDITH THOMPSON, C.B.E., Member of Council, Bedford College, University of London.

Sir SQUIRE SPRIGGE, M.D., F.R.C.P., Editor of THE LANCET, with

Dr. M. H. KETTLE, an assistant editor, as honorary secretary.

The Commission held 24 meetings, and the various subcommittees appointed held 25 meetings in addition.

At the first meeting of the Commission, held on Dec. 8th, 1930. it was decided to issue a questionnaire addressed to the responsible authorities of all the hospitals approved as training schools by the General Nursing Councils, and also to a sample of the hospitals not so approved. The procedure adopted in connexion with the issue of this questionnaire, and with the analysis of the information received. was set out in the First Interim Report of the Commission, which was published in THE LANCET of Feb. 28th, 1931. The Second Interim Report, containing the statistical analysis by Dr. Bradford Hill of answers to the questionnaire, was published in THE LANCET of August 15th. 1931. Both Interim Reports are reprinted as appendices to the Final Report. The information analysed was collected from 686 hospitals and relates to the conditions of service of a nursing staff numbering nearly 44,000.

Two other questionnaires were subsequently sent out respectively to trained nurses working in hospitals and to probationers known to have a good secondary education. In addition, groups of girls still at school and older girls were questioned. The results of all these inquiries are summarised in the Final Report.

A gratifying response was moreover received to a request for evidence, to which the press of the country gave generous publicity. The mass of correspondence received by the Commission was in itself an indication of the wide interest aroused in the investigation. We set out below the Table of Contents of the Final Report and the Introduction. Other excerpts from the Report will appear next week.

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II.—EVOLUTION OF BRITISH NURSING.

Mediæval Developments—The General Decline in Nursing—The Decline of Nursing in this Country—The Plight of Certain London Hospitals—Early Efforts at Reform—The British Nursing Orders—Florence Nightingale—Modern Times.

III.—THE PRESENT POSITION.

The Barrier to Coöperation—Misconceptions on Both Sides—"What More do They Want?"—The Value Placed on Routine—A Conflict of Ideals—Criticism from Within—Responsibility without Trust—The Traditional Outlook and the Modern Outlook.

IV.—SHORTAGE OF CANDIDATES FOR THE NURSING PROFESSION.

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(B) *Kind of Shortage.*
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(C) *Reasons for Shortage.*
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V.—DISCUSSION OF MAIN REASONS FOR SHORTAGE AND RECOMMENDATIONS.

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(D) *Conditions of Admission and Service.*
Sources of Discontent—Position of the Matron. (*a*) Conditions of Admission: The Initial Reception—Contrasts in Rules and Contract Forms—Suspension and Dismissal—Recommendations. (*b*) Conditions of Institutional Life: Accommodation—Diet—Social Relations in the Nurses Home—Bedtime—Supervision of Bedrooms—Smoking—Uniform—Recommendations. (*c*) Facilities for Social Life Outside the Institution: Advance Notice of Off-duty Time—Removal of Restrictions in the Evening—Telephone—Guest Rooms—Compulsory Attendance at Meals—Annual Holiday—Recommendations.

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[1] Pp. 256. 2*s.* 6*d.*; 2*s.* 9*d.* post free. Obtainable from THE LANCET Office, 7, Adam-street, Adelphi, W.C.2, and from all booksellers.

the brain. His work in relation to the functions of the mammæ and the ovaries was equally new and direct, while, before de Graaf, he maintained that the "testes muliebres" were ovaries, and demonstrated the yolk-sac and vitelline duct in a shark. Of his work on the brain, which contained much acute criticism of the knowledge and theories of the day, Dr. Meisen said: "One of his best known contributions to science is his lecture on the anatomy of the brain, delivered in French at Paris in 1664, where he begins in this startling way: 'Gentlemen. Instead of promising You to still your curiosity regarding the anatomy of the brain I have to confess to You my sincere opinion that I do not know anything about it.' . . . He then undertook—as Edward W. Adams[1] says—'the Socratic task of convincing the anatomical world of ignorance.' I quote one passage, which, like many other detached remarks or by-the-way sayings in his writings, has an address even to us in our times: 'To make the necessary inquiries for the discovery of truth a man's whole time must be taken up. . . . Physicians and surgeons cannot comply with this, because of their practise, nor professors because of their public demonstrations. Whole years may sometimes be necessary to discover what may afterwards be demonstrated to others in an hour.' The net effect of Steensen's studies was to correct the views of Willis, who located memory in the cortical substance, imagination in the corpus callosum, and common sense in the striate bodies."

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Dr. Meisen closed his Oration by pointing out that in Steensen's time the classic authors and the Old Testament constituted the scientific basis of investigation, most of the scientific discoveries being made by men who were first of all scholars, as was Harvey. Steensen in particular was an ardent student of mathematics, the mathematical sense and the vigorous imagination being remarkably blended in him, as they were in Pasteur whom he resembles both in powers of intuition and boldness of conclusions. Comparing Steensen's work with that of his friend, and comrade, Malpighi, Dr. Meisen says: "It must always be remembered that Malpighi possessed that quite new instrument the microscope which enabled him to find gold where others could not, while he had a working life of 30 years and Steensen one of only 14 years." Certainly the orator justified the description of the Danish savant given by Michae Foster—"a singular man who 300 years ago pierced into questions which are still moving us at the presen day."

A MORE SENSITIVE WASSERMANN TEST.

At an early stage of its career the Medical Researc Council appreciated that everything should be don to bring about the adoption of a thoroughly reliabl Wassermann test. A series of observations (Speci Reports Series Nos. 14, 21, and 78) were carried ou by workers in this country, the result of which wa to show that a properly standardised Wasserman test possessed a very high degree of specificit Recently the introduction of certain precipitin test in particular the Kahn test in America, suggested certain circles that the Wassermann test was n all that it should be, both in regard to sensitivi and to specificity. But at the recent Laborato Conference on the sero-diagnosis of syphilis, held Copenhagen in 1928 under the health organisati of the League of Nations, it was shown that t Wassermann test as carried out in this country h nothing to fear in comparison with any of the flocc lation tests, and that the Wassermann test had high, if not higher, qualities of specificity than a test yet devised for syphilis. It had, however, be felt that in the ordinary standardised Wasserma test, as used in this country, a few cases might ha been missed; in other words, that the test might more sensitive if that could be arranged witho losing any of its high specificity. Several attem have been made to increase the sensitivity of Wassermann test by such things as fixation in cold, decrease in the amount of complement, changes in the antigen proportion, without apparen any very great success. It is therefore very intere ing to see that Dr. Wyler has pursued this mat further[1] and, as an outcome of his investigatio has devised a method which he considers has increa the sensitivity of the Wassermann test by someth like 20 per cent. The procedure he adopts is sim to double the quantity of the patient's serum in test as ordinarily used. This, as he says, is of con no new principle; it is, for instance, used in carry out the reaction with cerebral spinal fluid. Perh this is an admission on Dr. Wyler's part tha satisfactory quantitative Wassermann test can carried out by using varying quantities of patie serum. Using increased amounts of sera, Dr. Wy has done a series of tests on 1000 sera, over 400 which were from known cases of syphilis. Compa tive tests were carried out against the ordin Wassermann and against the Sigma test, and it see that the test with the newer technique is definit more sensitive than either. Confirmation of th findings will greatly enhance the reliance which placed in this country on the Wassermann t Dr. Wyler is to be congratulated on the lucidity w which he has put forward his data.

MANCHESTER VICTORIA MEMORIAL JEWISH H PITAL.—It has been decided that in future the visiting ho shall be in the evening, on the ground of convenience for working-classes.

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[1] Adams in Medical Library and Historical Journal, 1901, vol. ii., No. 1.

[1] A Method of Increasing the Sensitiveness of the Wasserm Test. By E. J. Wyler, M.C., M.D. Lond.; Ministry of Hea Reports on Public Health and Medical Subjects, No. 67. H Stationery Office. 1932. Pp. 15. *1d.*

has to wait for attention, or is so conscious of the overwork of the nurses that he hesitates to ask for it; when the doctor's orders are carried out with less promptness and skill than they should be; and when anxiety to get the necessary work done obsesses the minds of the senior nurses to such an extent as to lead them to spur their juniors to get through their tasks quickly, while giving little teaching in the individual care of patients. In hospitals where acute shortage exists, new probationers may be flung into understaffed wards to take their part in the daily struggle against time. The wards have to be kept clean and tidy, and so many patients have to be washed and fed and settled, dressed or dosed, that the probationers are bewildered and discouraged; the patient feels that he gets little personal attention; and the trained staff complete the essential routine work only by sacrificing their own scanty leisure. It will hardly be possible to protect hospital patients from suffering from such a shortage unless it is remedied soon. It is an axiom in the nursing profession that the patient comes first, and throughout our work it has been the patient whose interests have been uppermost in our minds. It is useless to provide hospitals and doctors for the sick unless an adequate nursing service can be assured.

SAFEGUARDS AGAINST OVER-RECRUITMENT OF NURSES.

5. It would not, however, be justifiable to invite more probationers to take a nurse's training than the profession could absorb, merely in order to provide our hospitals with student labour. The number of apprentices must be kept within reasonable bounds, or eventually unemployment will result. The limitation by the General Nursing Councils of the hospitals approved as training centres to those which can provide adequate experience should prove a safeguard against this danger. As the value of training leading to State registration, as opposed to that leading only to a hospital certificate, becomes more generally understood by the public, non-approved hospitals will no longer enlist the services of students; these hospitals will then provide additional posts for nurses trained at the approved training schools. In this way the nursing profession will be safeguarded from overcrowding when the removal of misconceptions and prejudice, and the adjustment of conditions of training and service in the approved hospitals make it again a popular avenue of employment.

(*To be continued.*)

MEDICINE AND THE LAW.

Substantial Sentence on Bogus Doctor.

George Edward Williams, whose real name was given as Flaxman, pleaded guilty at the Central Criminal Court on Feb. 8th to charges which were outlined in THE LANCET of Jan. 23rd at p. 203. The accused had apparently had the courage to annex to himself the name and degrees of an existing medical practitioner resident in Wales. His medical experience, according to his counsel, consisted of his having been a steward in a hospital and of service in the ranks of the R.A.M.C. during the war. The gravest charge against him was that of having committed perjury on the trial of an action in the Clerkenwell county court where, posing as an expert medical witness, he had sworn that he had been in practice for 26 years, and that he possessed the qualifications M.D. (Cambridge), M.R.C.S., L.R.C.P., and D.P.H. A second charge concerned his unlawful possession of drugs within the Dangerous Drugs Acts; not being a registered medical practitioner, he had no authority under the Acts and Regulations to possess or supply such drugs. On each of these two charges he was sentenced to three years' penal servitude, sentences to run concurrently. On a third charge—making an untrue statement for the purpose of procuring a passport—no sentence was passed.

The case neatly illustrates facts of which the medical profession is aware and the general public is largely ignorant. The fine old preamble of an Act of Henry VIII. states that "the science and cunning of physic and surgery (to the perfect knowledge whereof be requisite both great learning and ripe experience) is daily within this Realm exercised by a great multitude of ignorant persons of whom the greater part have no manner of insight into the same . . . to the high displeasure of God, great infamy to the faculty, and the grievous hurt, damage, and destruction of many of the King's liege people, most especially of them that cannot discern between the cunning and the uncunning"—words which served as a type for the preamble to the Medical Act of 1858 which in simpler language recites that it is "expedient that persons requiring medical aid should be enabled to distinguish qualified from unqualified practitioners." The modern Statute is not concerned with the divine displeasure or with the great infamy to the faculty; but it does take note of the peril to the life and health of a patient where an untrained and unqualified man like Flaxman imposes upon the confidence of the sick and suffering. From the public point of view the true gravamen of the accusations against Flaxman is this fraudulent and dangerous posing as the possessor of expert qualifications. The law allows great latitude. Flaxman, though unregistered and unqualified, could, with a remarkable degree of impunity, administer almost any kind of medical treatment, and (as recent unsuccessful proceedings in R. *v.* Ensor indicated) call himself 'doctor' or allow himself to be so called. The one thing which the law forbids is his falsely representing himself to be a registered practitioner or to have certain medical qualifications. This offence Flaxman undoubtedly committed. Was he charged with it? No. Why not? Because the punishment is negligible. The following statutory table of maximum penalties for the offence of falsely representing oneself to be registered or duly qualified in various professions is instructive:—

Medical practitioner ..	£20 (21 & 22 Vict., c. 90, s. 40).
Veterinary surgeon ..	£20 (44 & 45 Vict., c. 62, s. 17).
Architect	£50 for first offence, £100 for any subsequent offence (21 & 22 Geo. 5, c. 33, s. 10).
Dentist	£100 (11 & 12 Geo. 5, c 21, s. 1).

It is more than twice as serious, therefore, to pretend to be a registered architect, and five times as serious to pretend to be a dentist, as it is to pretend to be a registered medical practitioner. The gross fraud of which Flaxman was guilty led him into certain consequential or subsidiary actions. Having once adopted the pose of being a duly-qualified practitioner, he was committed to consequences such as maintaining his pose in the witness-box or prescribing dangerous drugs. For these consequential actions he receives the substantial sentence of three years' penal servitude. For the cardinal and principal fraud, the source from which those actions flowed, the penalty is so trivial as not to be worth inflicting.

Stealing a Practitioner's Name.

Flaxman's case is the second instance within the past few months of an unqualified person assuming

VI.—REASONS FOR SHORTAGE OF TRAINED STAFF.

Small Pay and Lack of Freedom—Counter Influences—Temporary Posts.

VII.—DISCUSSION OF REASONS FOR SHORTAGE OF TRAINED STAFF AND RECOMMENDATIONS.

Restrictions of Institutional Life—The Living-in System—The Need to Encourage Administrative Ability—Employment of Probationers as Staff Nurses—Recommendations.

VIII.—THE STAFFING OF NON-APPROVED HOSPITALS.

Recommendation.

IX.—TUBERCULOSIS HOSPITALS.

State Registration for Tuberculosis Nurses—Monotony and Isolation—The Fear of *Infection*—Ex-patients as Nurses—Recommendations.

X.—MENTAL HOSPITALS.

Difficulties Peculiar to Mental Hospitals: (*a*) The Nature of the Work; (*b*) Types of Patient and the Nursing Required; (*c*) Facilities for Double Training; (*d*) The Two Forms of Qualification; (*e*) Drifters—Some Special Considerations—Calculation of Net Salary—Superannuation—Arrangement of Hours of Work—Domestic Work in Mental Hospitals—Isolation of Mental Hospitals—Recommendations.

XI.—SOME QUESTIONS OF POLICY.

Establishment of Schools of Nursing connected with Universities—A Simpler Form of Registration—Substantial Shortening of Courses of Training—Grading—Propaganda.

XII.—CONCLUSION. XIII.—COLLECTED RECOMMENDATIONS.

Appendices.

(i.) List of Witnesses.

(ii.) Individuals and Bodies (other than those submitting replies to Questionaires or those mentioned in Appendix (i.) by whom written Communications were forwarded to the Commission.

(iii.) Information Obtained from Various Sources on the Attitude of Girls towards the Nursing Profession.

(iv.) The Questionnaire to Probationer Nurses.

(v.) Draft Syllabus for a Pre-Nursing Course Approved by the Association of Headmistresses and the College of Nursing.

(vi.) Matron's Estimate of Cost of Replacing Untrained by Trained Nurses at Guy's Hospital.

(vii.) The College of Nursing: Scale of Minimum Salaries Recommended.

(viii.) The Cost of the Nursing Services in 20 Hospitals.

(ix.) Pay and Allowances in Special Public Services.

(x.) Summary of the Federated Superannuation Scheme for Nurses and Hospital Officers (Contributory).

(xi.) Summary of Superannuation Schemes in Municipal Hospitals.

(xii.) Section 8 of the Local Government and Other Officers' Superannuation Act, 1922.

(xiii.) Schedules of Hours of Work (*illustrated*).

(xiv.) Types of Duties Required in the General Practice of Nursing.

(xv.) Typical Schedules of Work for Female Ward Orderlies.

(xvi.) The Questionnaire to Trained Nurses.

(xvii.) First Interim Report: Reprinted from THE LANCET of Feb. 28th, 1931.

(xviii.) Second Interim Report: Reprinted from THE LANCET of August 15th, 1931. Statistical Analysis of the Questionnaire issued to Hospitals by THE LANCET Commission on Nursing. Dr. Bradford Hill's Final Report.

The Introduction to the Report.

In the introduction the scope of the Report and certain important considerations are defined as follows:—

1. Conditions of service and education in the nursing profession are being closely studied in many countries and from many points of view. Our own contribution to this study is a report on the shortage of candidates for work in hospitals in this country, and on means by which this shortage may be overcome. The object of our recommendations has been to suggest an adjustment of the conditions offered, in order to attract in sufficient numbers young women of the right type to fulfil an essential public service. We have not sought to look far ahead, and where we have considered such subjects as the costing system of hospitals, the arrangement and standards of professional examinations, the amenities of a nurse's life, or the permanent prospects open to her, our terms of reference have been borne constantly in mind.

ADAPTATION RATHER THAN RECONSTRUCTION.

2. We have confined our attention as far as possible to proposals which would involve adaptation rather than fundamental change in the system on which the nursing services of this country are at present carried on. For this reason we have not dealt except in outline at the end of the Report (see paras. 338 to 346) with certain issues affecting the internal organisation of the nursing profession. These include the establishment of schools of nursing in connexion with universities; the replacement of the present five registers by one register with supplementary diplomas; a *substantial* shortening of courses of training; and the official recognition of two grades of nurses. It would be difficult to predict the ultimate effect on recruitment for work in hospitals of any of these changes. In any case, a reconsideration of the whole basis of State registration only 12 years after its inception would be premature, at least until a real effort has been made to remove the causes which make work in hospitals no longer attractive to young women. Progress can, in our opinion, best be made by accepting the complicated system which was set up as a compromise between many interests, while recognising that the lack of eagerness on the part of girls from *secondary schools to train* as nurses shows that adjustments are needed unless the whole system i to break down. We have dealt chiefly with the adjustments required in the hospitals of the country taken as a whole, believing that the peculiar difficultie of certain types of hospitals will be met more easil when those common to nearly all hospitals have bee recognised and, as far as possible, resolved. For thi reason we have not devoted separate Sections t each of the groups of hospitals differentiated in D Bradford Hill's analysis (Appendix xviii.). Most our recommendations apply, in greater or less degre to Children's hospitals, Fever hospitals, and Affiliate *Associated*, and Reciprocal hospitals. This is al true of Tuberculosis and Mental hospitals, thoug these have been considered separately.

THE DEPENDENCE OF THE HOSPITALS ON STUDENT LABOUR.

3. To restore the popularity of nursing amon educated girls has been the chief objective of o inquiries. The economic and the administrati difficulties of hospitals, the vocational ideals of sor nurses and the professional aspirations of othe concern us only in so far as they promote or hind our object of inducing enough educated girls to cor forward to dispel anxiety about the nursing care the sick in hospitals. We have had to devote clo attention to conditions of training as well as employment, because hospitals have long depend for their nursing service largely on students eag *to learn. The ratio of* the untrained to the train staff is approximately 2 to 1 even if staff nurses a all counted as trained staff; thus, the fact th admission to a course in nursing is no longer keen sought means *not* only the prospect of a shortage nurses in the future, but an actual shortage of worke in hospitals to-day.

THE EFFECT OF SHORTAGE OF NURSES ON THE PATIENT.

4. Hitherto the patients have rarely been allow to suffer. Deficiency in the quantity and quali of the candidates for nursing them has been met imposing an increased strain on the members the trained staff and on those who do come forwa for training. But the time must come, and it h already come in some hospitals, when the patie

preliminary sciences and to the special branches. A very large amount of the work of the general practitioner is concerned with disorder of function unaccompanied by obvious disorder of structure. The present curriculum is much too largely concerned with the latter. Much more time must be made available to the student for his study of practical medicine. The strain on the mental and physical condition of the student towards the end of his third academic year is absurd: but a very small part of that strain is, however, directed to clinical work. A judiciously reorganised curriculum would allow attention to be paid to some vitally important subjects which at present receive very inadequate attention—e.g., nutrition, heredity, psychotherapy, physicotherapy, antenatal work, and preventive medicine.

Dr. Watson outlined a scheme of revision for the medical curriculum of the University of Edinburgh.

NOTES FROM INDIA.

(FROM OUR OWN CORRESPONDENT.)

CIVIL AND MILITARY MEDICAL COÖPERATION.

PARTLY as a result of the constitution of the Indian Medical Service, the army medical organisation in India, ever since the British connexion, has been intimately associated with civil work. Up to quite recent times it was the Indian Medical Service, almost exclusively, which ran not only the important hospitals, but also the medical colleges and schools, and a large proportion of the cadre was employed in this way. At the same time it was always understood that the army had the first claim, and at times of great military stress the bulk of that portion of the service which was employed in civil work reverted to the army. But conditions have changed in the course of Indianisation. Civil appointments have been curtailed, and the connexion between the civil and military branches is not so close as it used to be. Further, from time to time it has been urged by nationalist interests that civil medicine should be entirely divorced from military, and attacks are still made on the Indian Medical Service with this object in view. It is therefore interesting to note that, as a result of the present financial stringency, which has hit the recently extended Bombay hospitals particularly hard, influential Indians are now proposing that the army medical department should come to the rescue. Figures are quoted to show that, in times of peace, the military medical establishments are far in excess of requirements, and it is suggested that some part of them should be employed in the civil hospitals. As so often happens in cases of this kind, all the old arguments which tend to the opposite conclusion are forgotten, and when it is said that in 1931 the army had 12,743 beds at its disposal, and a personnel of 16,648 to look after them, the exponents of the new proposals seem to assume that nothing further remains to be discussed. The fact is of course that such figures include not only hospital attendants, but ambulance corps, and various other details who have nothing to do with actual hospital work; while the necessity of being prepared for military emergencies is entirely ignored. Many good authorities have thought that a close connexion between the military and civil hospitals and medical services serves the needs of India better than the entire divorce which has recently been advocated by both medical and lay nationalist enthusiasts. This association is still maintained, to some degree, through the medium of the Indian Medical Service, but with the contraction which has taken place within recent years it has greatly diminished, and to reverse the policy which has been persistently pursued on account of a temporary crisis hardly seems reasonable.

THE SOCIAL EVIL.

International collaboration with a view to checking the traffic in women and children was started about 30 years ago. The war against this traffic is now being extended to the east, under the auspices of the League of Nations, and various countries which are concerned, including India, have expressed their willingness to coöperate in preliminary inquiries. A committee consisting of three members, one American, one Swedish, and another a Pole, started work in October last. It is expected that about 18 months will be spent in visiting various eastern countries. This will no doubt strengthen the efforts already being made in some large Indian cities to deal with prostitution. In Bombay a Bill was passed last year to enable the police to close brothels. Owing to the civil disobedience movement, which threw a great strain on the authorities, action was delayed for some time, but an energetic campaign is now in operation. Measures were first taken to close the foreign houses. All were visited by the police, and the proprietors warned that unless they broke up their establishments by a certain date they would find themselves in jail. It is intended to carry out the same procedure with regard to Indian brothels later on. How far these measures will be successful remains to be seen. The police authorities at one time certainly doubted whether any legislation of the kind would do more than drive the evil underground. One good result, at all events, should be some safeguarding of British and foreign seamen in the port, and from the medical point of view anything which holds out a prospect of limiting the incidence of venereal diseases, which are so rampant throughout the East, is worthy of support.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.

HUNTERIAN FESTIVAL.

AFTER the delivery of the Hunterian Oration (see p. 381) on Feb. 15th the President and Council held the Hunterian festival dinner in the library of the College. The company included:—

Members of Council.—Mr. R. P. Rowlands and Mr. Sampson Handley (Vice-Presidents), Sir Holburt Waring, Prof. E. W. Hey Groves, Sir Percy Sargent, Prof. G. E. Gask, Mr. McAdam Eccles, Sir Charles Gordon-Watson, Prof. A. H. Burgess, Mr. Warren Low, Mr. Victor Bonney, Prof. G. Grey Turner, Mr. Hugh Lett, Prof. Leonard Gamgee, Prof. R. E. Kelly, Prof. Graham Simpson, and Mr. A. J. Walton: with Sir Arthur Keith (Conservator of the Museum) and Mr. Forrest Cowell (Secretary).

Guests.—Sir Henry Betterton (Minister of Labour), Lord Atkin, the Dean of St. Paul's, Sir Gowland Hopkins, P.R.S., Dr. T. Watts Eden (President of the Royal Society of Medicine), Sir George Makins, Sir Farquhar Buzzard, Sir D'Arcy Power, Surgeon Vice-Admiral R. St. G. S. Bond, Sir Harold Fawcus, Sir William Bragg, F.R.S., Mr. Charles Lupton, Mr. C. Tate Regan, F.R.S., Prof. William Bulloch, F.R.S., Mr. R. H. Burne, F.R.S., Sir Frank Colyer, Sir Henry Dale, F.R.S., and Sir David Murray, R.A.

Lord MOYNIHAN, proposing the health of The Guests, said that the College was famous for its hospitality: its visceral aristocracy included parts of the two oldest inhabitants of Europe, the Piltdown and Gibraltar skulls; the most ancient mummy in existence; the heart of the Pharoah of the Oppression;

the name of a practitioner whose name is on the Register. His case has been discussed in the preceding paragraph from the public point of view. A practitioner whose name is thus borrowed and abused has a personal grievance. Adventurers must somehow be discouraged and prevented from dipping at random into the pages of the Medical Register and annexing any name they fancy. Apart from other legal aspects, such conduct possibly discloses an offence against the Registration of Business Names Act, 1916. "Business" in that statute includes "profession," and "every individual having a place of business in the United Kingdom and carrying on business under a business name which does not consist of his true surname . . . shall be registered in the manner directed by this Act." The penalty for default in registration runs at the rate of £5 a day. The statute was a war-time enactment. It hardly seems an appropriate weapon against frauds such as Flaxman's, and there may be awkwardness in applying it. It creates, however, no difficulties for the honest practitioner or for bona-fide changes of name.

Hospital Death Due to Mistake in Medicine.

An unfortunate mistake in a local hospital led to the holding of an inquest at Dartford on Feb. 8th. Evidence was given that death was due to heart failure brought about by belladonna poisoning. It appeared that a probationer nurse, aged 17, had been given the key of the medicine chest for the purpose of administering aperients to patients. Unhappily a bottle containing a mixture of belladonna and glycerin was taken from the medicine chest instead of a bottle containing syrup of figs. It was stated that the medicine chest stood low down and was badly lighted. It should have been cleared out each week, but this had not been done for some time. It was the usual practice to keep the special drugs on one side of the chest, but there was no partition. Some bottles containing poison were blue; others had nothing to distinguish them. Neither the matron nor the sister in charge could explain how or when the belladonna bottle found its way into the medicine chest. The coroner observed that the evidence showed great want of care and supervision. The young nurse was hardly old enough to have charge of the administration of medicines, but the blame should not be laid on her shoulders alone. The bottles and labels should not have been used as they were, and the shape and size of the bottles should not have been similar. A verdict of "accidental death" was returned.

SCOTLAND.

(FROM OUR OWN CORRESPONDENT.)

EDINBURGH MUNICIPAL HOSPITALS AND THE TEACHING OF MEDICINE.

THE Edinburgh hospital scheme is moving forward. It is probable that the report of the joint committee representing the University and the Corporation will be approved of, and that an agreement will be entered into with the University on the lines of that report. The proviso is made that the agreement may be terminated or revised at the end of three years, and also that the sum to be paid to the University on account of services rendered by the part-time staff in respect of municipal hospitals shall not exceed £2000 per annum. A draft scheme is to be prepared and submitted to the Department of Health for Scotland for the reorganisation of the hospitals belonging to the Edinburgh corporation at Pilton, Craigleith, and Seafield, and this draft scheme will contain provisions for removing Craigleith and Seafield hospitals from the category of poor-law hospitals in so far as Edinburgh residents are concerned.

This important decision means that Craigleith and Seafield hospitals will now be converted into general hospitals under the health committee, and will be available for teaching. Pilton hospital is already in this position. The arrangement with the University is both for teaching and for treatment. To protect the Royal Infirmary and the other voluntary hospitals, as regards the part-time staff, the appointments should be made by the University and the corporation jointly.

The three institutions will be taken as constituting one hospital system. According to the town clerk's statement, four main units would be formed: (1) medical; (2) surgical; (3) obstetrical and gynæcological; (4) children. The staff of each unit would consist of a director, who would have the status of a full physician or surgeon; one assistant physician or surgeon, or more; and one clinical tutor or more. There would be the part-time officers under the joint appointment, and, in addition, full-time resident physicians and surgeons. The general administration of this hospital system would be under the control of the medical officer of health. The corporation will thus have at their command the best medical service which the city can produce, in the same way as the Royal Infirmary. The joint report by the University and the corporation recognises the advantages of this arrangement. Teaching ensures greater regularity and thoroughness of working. The provision of a staff composed of teachers increases confidence. The medical school benefits by the increased number of beds. The students will have the advantage of more clinical instruction in chronic illness. Clinical research will find abundant material of a kind not provided by the voluntary hospitals. The training of nurses will benefit by the better facilities. The pressure on the voluntary hospitals will be relieved.

As regards the new facilities for teaching and research, it is accepted that the students of the school of medicine of the Royal Colleges shall share the opportunities with those of the University. Thus the difficulty between the University and the extra-mural school has been solved.

THE REFORM OF MEDICAL EDUCATION.

Addressing the Edinburgh Medico-Sociological Club on Feb. 5th, Dr. Chalmers Watson pointed out that not a few prominent critics of modern education have condemned the prevailing tendency towards excessive specialisation in teaching, resulting in a failure to teach the essential fundamental principles. It is increasingly recognised, he said, that there is something inherently wrong with our present system of medical education. Students are systematically overtaught and overcrammed; they have no time to teach themselves, their training in clinical medicine is seriously inadequate. The curriculum is framed without adequate orientation to the later work of the practitioner. This defect is not due to lack of teachers. In the last 40 years the number of medical graduates in Edinburgh has lessened to the extent of 60 graduates, whereas the number of teachers has increased by 68, this taking no account of the increase in the clinical teaching staff.

In former days, said Dr. Watson, medicine and clinical medicine rightly constituted the "hub" of the medical curriculum; to-day it is hardly too much to say that they are subordinated to the circumstances of the case, having in mind particularly the number of persons on the respondent's panel who appear to have required the administration of hypodermic injections of morphine," the Inquiry Committee reports that it is satisfied that the insurance committee's allegation on this point is made out—namely, that the Dangerous Drugs Acts disability placed the respondent in a position in which he could not comply with his Terms of Service.

The decisions of the Minister of Health in these cases of complaint against a panel practitioner are necessarily based upon the particular facts of each investigation rather than upon any general principle evolved by a series of recorded judgments. The cases naturally fall into groups according to the degree of culpability and the standardised penalties deemed appropriate. One case does not otherwise serve as a precedent for another, but the result in the Liverpool case gives a warning of what may be expected where similar facts are proved.

Anæsthetics in Panel Practice.

When the scheme for panel practice was drawn up, the ideal arrangement suggested and embodied in the Terms of Service was that a doctor should be able to call in a fellow practitioner to give an anæsthetic when wanted for an operation, payment to come out of the local fund as a first charge on the medical funds for all services. It was generally agreed between panel and insurance committees, and included in the local distribution scheme, that appropriate fees would be one guinea for a general anæsthetic and half a guinea for gas. No fee is paid for a local anæsthetic. The claim for the anæsthetic fee has to reach the insurance committee within seven days of the administration, giving particulars of the case, including the time taken for the operation, the anæsthetic used, and so forth. The insurance committee in turn sends the form to the panel committee for review. The practice of panel committees varies throughout the country; some refuse all anæsthetic payments on the assumption that such service is reciprocal. Others allow certain claims, but not where partners or assistants have acted as anæsthetist. The matter has been considered by the London Panel Committee on several occasions in the past year. In London where it has been the custom of the committee, except in very exceptional cases, to pass all claims, their number has increased largely, although many practitioners give anæsthetics for each other without making any claim. Investigation showed that over 50 per cent. of claims were made by partners or by principal and assistant, and further examination suggested that a number of the cases might have been operated upon with a local anæsthetic without fee. For this and even more cogent reasons, the committee passed a resolution that they wished anæsthetics to be included in the general services without special payment. As this involved altering the Terms of Service for the whole country, a second resolution was passed asking the London Insurance Committee to agree to the alteration of the local distribution scheme whereby all anæsthetics should be paid for at a nominal fee of one shilling until such time as the Ministry of Health agreed to incorporate anæsthetics in the general services obligatory on all panel doctors. It will be interesting to see the effect of this alteration if sanctioned by the Ministry.

Excessive Prescribing.

From time to time panel practitioners receive from their insurance committee, through the pricing bureau, two sets of figures showing for each doctor, and for all doctors in the area, (1) the average number of prescriptions issued per person on list; (2) the average cost per prescription issued; and (3) the average total cost per insured person on list. If there is marked discrepancy between the individual figures and the average for the area, the Ministry of Health instructs a regional medical officer (often accompanied by a member of the panel committee) to call on the practitioner and ask for his explanation of the excess—for there is no case on record of an explanation being asked for the cost being below the areal average. If he gives a satisfactory explanation, for example, a diabetic case requiring insulin, or a bad case of cancer requiring many dressings, the matter there ends. But if the explanation is not thought satisfactory, the Ministry refers the prescriptions to the panel committee for investigation. The practitioner is invited to attend and the committee goes through the prescriptions in detail, looking out for the exceptionally costly preparations. The practitioner is asked to explain his method of prescribing, and to account for his costs being so much above that of his colleagues in the area. The difference in cost between what has been ordered and what might reasonably be considered suitable for such treatment is the cost that the panel committee will report to the Ministry, to the practitioner, and to the insurance committee, as the excess that the practitioner has imposed on the drug fund over and above the reasonable treatment of his patients. Local conditions and epidemics are taken into consideration as well as the age factor of patients. Both Minister and practitioner have the right to appeal to a court of medical referees appointed by the Minister, if either is dissatisfied with the finding. A Birmingham doctor was in December last found to have imposed £10 upon the drug fund in excess of what was reasonably necessary for the treatment of his patients. The excess was largely due to the prescribing of Brompton lozenges. He did not appeal against the surcharge.

Hypodermic Syringes for Asthma.

The regulations enjoin every practitioner on the panel to provide all proper and sufficient drugs for the treatment of his patients, but he may only order such appliances as appear in an authorised schedule. In these straitened times the authorities are unlikely to increase the size of this schedule unless it can be shown that hardship would result to patients through failure so to do. From several quarters has come a request to include hypodermic syringes for the self-treatment of asthma with suprarenal extract, as on a par with the supply of syringes already granted in the case of insulin for diabetes. No doubt the case for insulin was stronger as it can only be given hypodermically and life may depend on the proper dose at the proper time. But there is many an asthmatic patient who must pass hours of torture if a hypodermic syringe is not accessible; at present the patient must pay for it himself, it does not come out of the drug fund. The only difference it makes to the doctor is that if he orders the syringe on a panel prescription form, he is surcharged by the insurance committee through its pricing bureau and he may have difficulty in getting the cost back from his patient. It makes no difference to the approved society beyond the possible fact that in a case of hardship the society may agree to defray the cost of the syringe if it were shown that the patient was unable to afford it. Societies have funds available for other surgical appliances, trusses, and the like. But we think there is sound sense in being considerate to the asthmatic patient in this matter.

the bodies of a king and queen of Ur; a rib of Robert the Bruce; part of the "bowels that yearned" of Napoleon. Passing to its living guests, he welcomed especially Sir Hilton Young, who, as Minister of Health, was associated with one of the great adventures of medicine—the British Post-graduate Medical School; Sir Henry Wellcome, who had done more than any other living Englishman to advance research connected with medicine; and Sir Buckston Browne, to whose wisdom and foresight the College owed its research institute at Downe. Many great institutions died of dignity, some of rigidity. The College must not content itself with its old ideals of being an examining body with museum and library, but must ally itself as closely as possible with research.

The Duke of ATHOLL, in reply, described his experiences as a surgeon in the Sudan and at the hands of surgeons elsewhere. From earliest youth, he said, he had wanted to be a surgeon, and he was glad to be associated with the London Clinic and Nursing Home, which would, it was hoped, bring both medical and surgical skill within the reach of people of moderate means. He wished it to be understood that the Home was not a "tied house," since any consultant could attend patients there.—Sir HILTON YOUNG said that when he became Minister of Health he felt it his duty to give a conspicuous example of salubrity, but on shipboard had found it impossible to emulate all Lord Moynihan's hardy practices.

Lord DAWSON, proposing the health of the Hunterian Orator, emphasised the difficulties of giving praise to great men in their lifetime, as Mr. Trotter had suggested. Greatness was not always recognised; in 1872 even the Académie des Sciences refused to elect Charles Darwin because his theories were "a bad example which a body that respects itself cannot follow." Mr. Trotter, however, might at least be recognised as that rare thing, a master of thought and craft; a man with understanding of illness side by side with understanding of morbid processes; a man whose attitude foreshadowed the time when the artificial barriers between physician and surgeon would disappear; a man whose dislike of trappings and pursuit of truth made one say that the gods had called him.

Mr. WILFRED TROTTER, in thanking Lord Dawson, said that he stood there as a kind of surgical everyman and his own load of gratitude must be distributed to the surgical profession at large. He dated the rise of surgery from the time when the surgeon—hitherto bearing the same relation to the physician as the bricklayer's labourer bears to the architect—decided to have clean hands. To each of the professions the surgeon was indebted. The first successful amputation of the tongue was probably done under the auspices of the law. (As often happened, the operation was devised first and the proper use for it was discovered later.) From statesmen there was much to learn in the art of prognosis—the art of providing for the reconciliation of promise and fulfilment. The Services, too, had something to teach; for the science of strategy had been well defined as the discovery of design in things after the event. Could there be anything more valuable to surgeons in the not uncommon situation of explaining the successful operation to the bereaved? Finally, the Church had made its contributions to surgical art; but so far, said the Hunterian Orator in conclusion, he feared he had not acquired the clerical gift of being able to addres the same congregation twice in one day.

PANEL AND CONTRACT PRACTICE

Dangerous Drugs Acts Restrictions.

IF the Home Office withdraws a panel practitioner's authority to possess and supply dangerous drugs, does he ipso facto cease to be in a position to comply with his Terms of Service? The question has never been answered definitely in terms of general application. Some months ago [1] the Minister of Health took the lenient view that a particular practitioner could still adequately conduct his panel practice if certain other non-prohibited dangerous drugs were substituted and if he could on necessary occasions arrange for the coöperation of a colleague who was under no such disability. Recently in a Liverpool case the Minister has adopted the opposite course; the Dangerous Drugs Acts disability was one of several grounds alleged by the insurance committee against the panel doctor, not all of which were found proved; the Minister has decided to remove the practitioner from the medical list of the insurance committee.

The material clauses in the Terms of Service are paragraphs 9 (8), 9 (9), 9 (10), and 11 (1). They oblige the practitioner to supply, where requisite, drugs necessarily and ordinarily administered by a practitioner in person and drugs required for immediate administration; they oblige him to supply all requisite drugs to patients whom the committee requires him to supply; they oblige him to order such drugs as are requisite for the treatment of any patient and to sign the order with his own hand; finally they insist that, subject to certain specified modifications of the rule, the practitioner must give all treatment personally. In the Liverpool case the insurance committee set out, among other matters, the allegations that the practitioner had been convicted at th City Police-court (Liverpool) of several offence against the Dangerous Drugs (Consolidated) Regulations and that the Home Secretary had withdraw his authority as from March 18th, 1931, making thenceforth impossible for the practitioner to giv prescriptions for the purposes of those Regulation There was a further allegation that after that date th practitoner failed to order or supply drugs to thre specified patients as required by his Terms of Servic The facts of the conviction and the subseque Home Office action could not be controverted. regards the three named patients there was a dispute the insurance committee's case as to two of the thre broke down for want of evidence that the prohibite drugs had been necessary. The third patient ha died in May, *1931*; the practitioner produced letter from the patient's son expressing appreciatio of his father's medical treatment. The Inquir Committee reports that between Oct. 30th, 193 and Jan. 22nd, 1931, morphia grs. 76 had been pr scribed for this patient; after Jan. 19th, 1931, n morphia was prescribed for him until Feb. 27th, an thereafter only minute quantities were prescribe The tribunal had to say whether the Home Offic action in cutting off the power to prescribe morphi for this patient would bring about a failure to ord or supply drugs as required by the Terms of Servic The tribunal reports its inability to believe tha if the patient had been treated with morphia to th extent indicated by his prescriptions before Jan. 19t 1931, he would not have been prejudiced by i sudden cessation. For this reason and "in all th always causes the death of some abnormally susceptible individuals. The anticipated dangers of B C G have been amply demonstrated. Further, the history of the last three animals, cited by Dr. Griffith, which were exposed to natural infection should be a sufficient demonstration of the ineffectiveness of B C G. May I re-state the problem. Everyone who has attained adult years has been infected by the tubercle bacillus, but only a minority become diseased, because their resistance is not normal. If a normal immunity mechanism to the tubercle bacillus could be assured then tuberculosis would disappear. This can easily be achieved by a dead antigen. It is absolutely unnecessary to produce an immunity to withstand such an assaulting infection as the infection of millions of virulent bacilli as is done in the laboratory. Such infections do not occur in nature.

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[1] See THE LANCET, 1931, ii., 209.

I am, Sir, yours faithfully,
W. M. CROFTON.

University College, Dublin, Feb. 13th, 1932.

THE MECHANISM OF TUMOUR FORMATION.

To the Editor of THE LANCET.

SIR,—There are two clinical facts which may shed additional light on the interesting suggestions made by Mr. J. J. M. Shaw in his valuable paper on the Ætiology of Carcinoma.

(1) There are many patients with sallow, toxic faces and skin suggesting an anæmic state, but whose blood count is normal. These people's whole complexion and cutaneous state can be completely changed by permanganate lavage of the colon. This suggests that skin deficiency is related to intestinal toxæmia, and probably faulty intestinal absorption of essential biochemical elements. In this connexion his remarks about calcium and potassium are particularly interesting.

(2) These sallow skins, coated with sebaceous lipoid and other secretions, can be made to assume a temporary healthy appearance by pyretic treatment, or exercise hard enough to produce sweating. If treatment is prolonged this may become permanent. Analysis of the sweat will usually reveal a pH of about 6·6, which is more acid than the average. Also there is much lactic acid in the sweat.

A connexion between faulty skin and intestinal function and the genesis of epithelioma would appear to be a reasonable conclusion. The prophylaxis of this condition would then be the rectification of such faults of function and elimination.

I am, Sir, yours faithfully,

Portland-place, W., Feb. 11th, 1932. H. W. HALES.

REFERRED PAIN.

To the Editor of THE LANCET.

SIR,—The interesting inquiry into referred pain by Prof. H. H. Woollard, Mr. J. E. H. Roberts, and Dr. E. A. Carmichael, published in your issue of Feb. 13th (p. 337), calls for some comment. The discrepancy between the results of their experiments and some observations of mine[1] to which they refer appears to me to be due to certain differences between the methods we employed. Whereas they stimulated by compression the exposed trunk of the phrenic nerve in the neck, I stimulated the sensory terminals of the phrenic nerve on the under surface of the diaphragm in two patients with perforated duodenal ulcer and right shoulder-tip pain on whom I operated under spinal anæsthesia. Probably of more moment, however, than the difference between the methods of stimulation was the difference in the extent of subcutaneous anæsthesia induced. In the case they describe in detail as typical of nine experiments the authors infiltrated subcutaneously with novocain and adrenalin "an area about the size of a shilling internal to the acromio-clavicular joint," and found, on again lightly pinching the phrenic nerve, that there was merely a slight shifting of the area to which the pain was referred.

I should be very surprised if they had obtained any perceptible modification of the referred pain by so limited an anæsthesia. In my two patients I anæsthetised subcutaneously the whole area supplied by cutaneous nerves from the third, fourth, and fifth cervical segments. It should be noted that the *spontaneous* right shoulder-tip pain was abolished in one of my patients by this procedure, but was only modified in the other. The shoulder-tip pain *induced* by stimulating the under surface of the diaphragm with a swab was not abolished in either of my patients, but was greatly modified, as was shown by the much greater pain felt on a similar stimulation of the left side of the diaphragm. (The left shoulder-tip area was not anæsthetised.) I attributed my failure to obtain complete abolition of the referred pain in the shoulder to incomplete blocking of the third, fourth, and fifth descending cervical nerves. I should attribute the negative results of the experiments described by your contributors to the more limited area of subcutaneous anæsthesia that they employed.

These nerve-blocking experiments, however interesting and important though they are, form no essential part of the evidence for peritoneo-cutaneous radiation of pain. That process is made evident by the fact, as to which there is no dispute, that when the sensory fibres of the phrenic nerve are stimulated, the pain is referred *entirely* to the distribution of the third, fourth, and fifth cervical nerves in the shoulder-tip area, and is not appreciated by the sensorium as arising in the diaphragm.

I cannot refrain from expressing some astonishment at the first of the conclusions in the article to which I refer. The authors state that "the diaphragm behaves as a viscus, since light compression of the phrenic nerve occasions no sensation referable to its anatomical site." Surely it is characteristic of the abdominal viscera, as of the heart and lungs, that mechanical stimulation such as pinching when applied to them direct evokes no sensation of pain at all! The diaphragm, on the other hand, by reason of its somatic sensory innervation from the phrenic nerve, is exquisitely sensitive to mechanical stimulation.

It is, indeed, an arresting observation that stimulation of the sensory fibres of the phrenic nerve causes no pain to be felt in the diaphragm, but only causes pain in its metameric cutaneous nerve distribution. But it is not a new observation. And to say that the diaphragm in this respect "behaves as a viscus" betrays an obsession with the truth of Mackenzie's theory of a viscero-sensory reflex that one would hardly expect of such distinguished investigators. I venture to suggest that their experiments will merely focus attention once more on the profoundly important process of peritoneo-cutaneous (and pleuro-cutaneous) radiation of pain. We are only beginning to understand the nerve mechanism involved in that process, but I am sure that the phrenic nerve will prove to be the key to a proper understanding of the mechanism of referred abdominal pain in general.

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[1] THE LANCET, 1929, ii., 1240; and Abdominal Pain, 1931.

CORRESPONDENCE

B C G VACCINE.

To the Editor of THE LANCET.

SIR,—All your readers will share in the feelings of sympathy with Prof. Deycke expressed in your leading article last week (p. 353). His terrible sentence, incurred in all probability through the error of a subordinate, forms a tragic culmination to a brilliant career spent in the service of humanity. The article however expresses no sympathy with Dr. Calmette; and yet he too has suffered, through the Lubeck disaster, what must have been a period of mental torture during the trial and, even now after an official vindication, the sort of distress which no man of his generous nature can avoid in contemplating so much sorrow and loss associated, through no fault of his own, with his great experiment. For a very great and daring experiment, that of Calmette in connexion with B C G, has been an experiment demanding faith and courage as well as enormous personal effort and drive. Great energy was needed to organise the production, standardisation, and distribution in vast quantities of a vaccine which has already been used for hundreds of thousands of children all over the world; to say nothing of the attempt to correlate and analyse the results reported by countless medical men, some capable and critical, some wild and enthusiastic, some hostile and prejudiced, but all requiring the individual attention of Dr. Calmette.

It is very difficult to control such an experiment, and the results so far recorded, while amounting to a vast array of figures, do not appear to satisfy the statistical mind. Yet the issue at stake is of sufficient importance to justify something more dynamic, on the part of British medical science, than the policy of "*festina lente*" which, as your article says, may sometimes be wisdom. Eleven years have passed since Calmette first attempted, on the grounds of numerous animal experiments, the daring step of putting his vaccine to the only crucial test, the inoculation of human infants against tuberculosis. So long ago as 1927, Prof. M. Greenwood expressed doubt as to the adequacy of the statistical value of the evidence adduced by Calmette to establish the immunising efficiency of B C G; but the figures, if not conclusive in favour of the vaccine, seem at least to have proved that it was innocuous. This point may now be regarded as settled by the admirable animal experiments of Dr. A. Stanley Griffith set forth in your last two numbers. I myself, after similar experiments on a smaller scale, and after a visit to Calmette's laboratory, felt so secure on this subject of safety that I advised my colleagues in Wales to try B C G in cases where infants were born of tuberculous parents. It may be added that, through the kind help of Dr. Calmette in sending his vaccine, a dozen infants have been so treated in and around Cardiff without untoward result and, so far, without the development of tuberculosis, although living in most cases with infected persons. It is not easy to find opportunities to use the vaccine, and our results have as yet no statistical value either way, beyond adding to the evidence in favour of the innocuity of B C G. "This," as your article puts it, "is the crux of the matter."

My study of the subject leads me to refer for a moment to the three questions posed in your leading article. Let us consider (1) whether the administration of a living but non-virulent strain protects in a way which a vaccine of dead organisms cannot? It seems to me that the bacteriological evidence favours this view, although the matter cannot be regarded as finally settled. It can perhaps only be settled, for man, by experiments on man.

This latter consideration gives point to the second question (2) whether the risks inherent in the use of living-culture vaccines cannot be guarded against with reasonable precautions in a well-organised [illegible] answer to this question is given [illegible] by the fact that B C G, distributed to many thousands of infants from the Pasteur Institute, has been used without bringing that Institute into discredit. My advice would be that those intending to try B C G should obtain their supplies from the Pasteur Institute rather than attempt, like Prof. Deycke, to have the vaccine made up locally.

Your third question, then, needs to be redrafted as follows: (3) Whether the dangers of tuberculosis in infancy are so great as to render the attempt at preventive inoculation advisable? At this point I must, in respect of the general population of these islands, part company from the views held, for France, by Calmette. I do not consider that there is any justification here for universal anti-tuberculosis vaccination of the children of healthy parents living in uninfected homes. Their risk is too small to necessitate such a step and their inclusion in an experiment could only lead to confusion. Nor, in view of the results of tuberculin tests in healthy persons, do I expect success from antituberculous inoculation in the prevention of adult phthisis. In the case of infants born into infected households, however, the risk of infection is very great, and the question of B C G inoculation does arise. My own inquiries lead me to think that fully half the tuberculosis of childhood and adolescence in England and Wales occurs in those who have been exposed to infection in their homes. The observations of Dr. Lissant Cox in Lancashire point strongly to the conclusion that infants and young children in infected families contribute an undue proportion to the tuberculosis incidence in the child population there. It is my opinion that the campaign against tuberculosis ought to be concentrated especially on tuberculous families, and that in this campaign the anti-tuberculosis vaccination of infants might play a useful part.

It may well be that a carefully controlled experiment, designed on lines acceptable to medical statisticians as well as the bacteriologists and clinicians concerned, and confined to the infants born to tuberculous parents, might give us the conclusively favourable results which are still required to ensure the wide employment of B C G in this country.

I am, Sir, yours faithfully,
S. LYLE CUMMINS.

Tuberculosis Department, Medical School, Cardiff,
Feb. 15th, 1932.

PREVENTIVE INOCULATION AGAINST TUBERCULOSIS.

To the Editor of THE LANCET.

SIR,—It does not seem to me that any reasonable person can think the B C G method a desirable way to immunise human beings against tuberculosis. It is beset with the dangers always associated with a method of immunisation with a living antigen which between a school advocating small doses and another pinning its faith to intensive treatment. So far as I was myself concerned, while I pointed to the undoubted effects which can be produced by doses which may be described as not only relatively but absolutely small—in that they are near the point when demonstrable effects no longer occur—I was concerned rather with an attempt to lay down principles than to deal with the exact size of doses.

A great deal of recent writing on the subject is concerned with getting this or that amount of radiation, a greater or less number of erythema doses, "into the tumour," as the phasing goes. The underlying idea still seems to be that of the "lethal dose," although it is admitted that, even with the most intense applications, there is no certainty of killing every cancer cell. It seems to be held by this school that any future increase of voltage, by enabling a relatively greater amount of radiation to be delivered within the tumour, will necessarily improve results. It is my belief that the tissue reactions which are excited by X rays are of no less importance than their direct depressant effects upon malignant cells. And it is as certain as anything can be that, at any rate in the hands of some of its advocates, a single course of intensive treatment results in permanent damage to previously healthy tissues in the neighbourhood of the growth. The reaction may in rare instances accomplish the eradication of all cancer cells before the reacting tissues settle down into a permanently enfeebled state, from which further X ray treatment cannot raise them. In certain desperate cases such "forlorn hope" methods may therefore be justified. But to advocate similar dosage as a routine cannot be right.

In the course of my paper I made the following statement :—

> "With the exact details of dosage in various malignant conditions I am not here concerned. What I am contending for is the recognition of certain fundamental truths: that radiations act chiefly as agents for stimulating the resisting powers of the body; that it is impossible by any practicable radiation dosage to ensure in a few days or weeks the death of all cancer cells; and that methods of treatment which aim at conserving tissue response are alone sound in principle."

By "small doses" are usually understood such as were given twenty or more years ago. They produced results, but I never made any suggestion that we should adopt them as a standard. I am prepared to believe that the best dosage may be nearer to that of the big dose school of to-day than to that commonly used in the second decade of this century. What I am not prepared to believe is that the principle of the *therapia sterilisans magna*, which has failed signally in other branches of medicine, can be successfully applied in the X ray treatment of cancer.—I am, Sir, yours faithfully,

F. HERNAMAN-JOHNSON.

Brook-street, Grosvenor-square, W., Feb. 10th .1932

BRILLIANT GREEN FOR SYCOSIS.

To the Editor of THE LANCET.

SIR,—Dr. Garrod has had the great courtesy to send me his interesting and valuable paper on the "Chemical Prophylaxis of the Streptococcal Infections." His and Prof. Senin's technical conclusions will be accepted with gratitude by all thinking men. Lately my work has been chiefly directed to calling attention to the fundamentals which govern the effective activities of irritants upon the skin. Incidentally micro-organisms come into the picture. The suitability and convenience of the means used for their control should apply equally to the investigator as to the clinician.

Alcohol is cleanly and mildly antiseptic; frequent applications of it are harmless to the skin but inimical to bacteria. Upon protein the primary physical effects of alcohol, iodine, picric acid, tannic acid, &c. are similar, but they vary in degree and some have greater powers of penetration. Their first effect is what is called astringent, which is another name for flocculation of the superficial tissues. The sum of these effects makes these medicaments suitable for different stages in the many varieties of skin troubles. A knowledge of these factors is essential to the dermatologist if he is to apply remedies successfully. It would have been very helpful if Dr. Garrod had elaborated this aspect of the subject, when dealing with the numerous germicides mentioned in his paper.

Reverting to the chief theme of my letter, which was the cure of the superficial folliculites, coccigenic sycosis in particular (and in this connexion I use the word "cure" intentionally), neither a tendency to lean upon tradition, nor fashion as Dr. Garrod says is common, in his original article, nor yet a slothful attitude in accepting new ideas, is one of my many failings. May I point out to him that he has experimented with surgical spirit, which is alcohol diluted 1 in 5 of water. I use and advise pure alcohol, a very different proposition. Alcohol is not the only ingredient and the other details of the treatment must be fulfilled. Whether his patients are likely to prefer a speedy and not unsightly mode of treatment to one which at least produces an apparently alarming and certainly disagreeable appearance, I leave to Dr. Garrod's discretion to decide.

I am, Sir, yours faithfully,

Wigan, Feb. 12th, 1932. R. PROSSER WHITE.

VENESECTION IN HEAT-STROKE.

To the Editor of THE LANCET.

SIR,—The annotation on Heat-stroke in your last issue (p. 358) recalled to my memory a case I had many years ago when I was surgeon to the R.M.S. *Orizaba*, Orient Line, on a voyage from England to Australia. When passing through the Red Sea I was called to see a steerage passenger. I found a stout, middle-aged Irish woman with consciousness completely lost, flushed face, skin very dry and hot, stertorous breathing—temperature between 108° and 109° F. I tried every remedy I knew of and found recommended, but it was all in vain, so at last I decided to try venesection and truly the result was wonderful. Within a short time the patient was conscious and next day the temperature was nearly normal. It is a pity venesection is not more practised.

I am, Sir, yours faithfully,

J. JOHNSTONE REDMOND.

Elm Park-gardens, S.W., Feb. 15th, 1932.

PANEL HEATING OF HOSPITALS.—The new Benito Mussolini Tuberculosis Hospital in Rome which it is expected will be opened about the middle of next year, is to be warmed on the British panel system. The hospital will contain nine wards with 2500 beds, and will thus be one of the largest institutions of its kind. The system has been adopted on the recommendation of a committee of investigation which examined the system as installed at St. Bartholomew's and University College Hospitals and the Harrow Hospital memorial extension. Dr. Eugenio Morelli, the director of the hospital, afterwards tested it at one of the smaller institutions under his charge, and found that it worked perfectly in a room with open windows and is thus especially suited for sanatoriums.

Your contributors suggest that the nerve-blocking experiments of Lemaire and of Weiss and Davis, if confirmed, would render still more insecure the theory of referred pain which is generally accepted. They do not make clear the fact that Lemaire and Weiss and Davis all believed that their experiments supported Mackenzie's theory. I have dealt with that belief in my book, and will not repeat the argument here.

Finally, if your contributors have knowledge of any sound experimental or clinical evidence in favour of Mackenzie's theory of a viscero-sensory reflex, I would most earnestly ask them to make it public.

I am, Sir, yours faithfully,

Manchester, Feb. 14th, 1932. JOHN MORLEY.

CARDIOVASCULAR EFFICIENCY IN RHEUMATIC CHILDREN.

To the Editor of THE LANCET.

SIR,—Many clinicians will be grateful to Wing Commander Treadgold and Squadron Leader Burton for their work, published in your issue of Feb. 6th (p. 277), on the size of the heart in relation to cardiovascular efficiency. This work has been confined, I gather, mainly to healthy, or presumably healthy, young adults. During the last four years I have carried out a series of similar tests in a large number of children attending a rheumatism supervisory centre. The original details were given in a paper read to the children's section of the Royal Society of Medicine in Feb., 1929, and are also published in the report of the school medical officer for the County of London for that year.

In children the first problem is to determine what the size of the heart should be. Where there is a gross enlargement, as in the cases of old adherent pericarditis, or severe valvular disease and the cardiac impulse is very forcible, no difficulty is experienced. But in those vital early cases I find it impossible to say now, after a careful examination of some 3000 cases, where the apex-beat should be at any given age. I place very little value on percussion of the right side of the heart in children, except for very considerable changes. In a series of 243 cases examined for pulse changes it was found that :—

45	had a recumbent pulse-rate between	70–80
67	” ” ” ”	80–90
78	” ” ” ”	90–100
63	” ” ”	over 100

whilst the standing pulse-rate of this group was :—

17	between ..	70–80	76	between ..	90–100
52	” ..	80–90	100	were over ..	100

In a group of 187 cases, whose cardiac efficiency was estimated by the methods previously mentioned, the number rated below—

0	was	6	4	was	13	8	was	13
1	”	3	5	”	10	9	”	21
2	”	3	6	”	9	10	”	29
3	”	7	7	”	8	over 10	”	65

The number whose critical figure was 13 or over was 70, and this corresponds to the number of "heart" cases, 77, in the series.

The point I am trying to make is that in spite of adverse criticism the use of cardiac efficiency tests, *together* (and this is vital) with clinical signs and symptoms, affords a valuable means of assessing the progress of a cardiac case. The test has the fallacy of all numerical measures, but it has the merit of simplicity, and of being able to be performed without special apparatus in the consulting room or bedside. In another series of 208 cases analysed and divided into three groups :—

(*A*) 108 cases with definite evidence of carditis.
(*B*) 22 ” ” cardiac irritability, but no carditis.
(*C*) History of rheumatism, but no cardiac disease.

The following findings emerged :—

Resting pulse-rate.	*A.* (*a*) Active.	*A.* (*b*) Healed.	*B.*	C.
Over 100	46	81	40	80
Under 100	54	19	60	20

Definite cases.	Over 8.	Under 8.
Active	27	73
Inactive	75	25
Group *B*	40	60
Group *C*	80	20

The effect of exercise on the pulse-rate was :—

	Active.	Healed.	*B.*	C.
Increase in pulse-rate under 30	53	28	56	78
” ” ” over 30	47	72	44	22
Return to standing pulse-rate in 120 sec.	28	18	30	17
Pulse-rate raises after 120 ..	21	11	15	6

We have also found that the temperature o children attending the clinic is as often 99·2° F as under this figure—and we have come to regar a temperature of 99°, unassociated with any c the usual signs and symptoms of rheumatic feve as being normal under conditions of examinatio We have found that these emotional children hav unstable temperatures ; it is of course well recognise that rheumatic and choreic children are often of th emotional type.

In our series the blood pressures have all bee taken. A very usual systolic blood pressure is 10 while the diastolic average is 65. In the sever cases of mitral disease we have had pressures of 1 recorded, with corresponding rises of diastolic readin

The cases which have given us the greatest anxie have been the simple tachycardias with a mild fev I find that it is clinically impossible to separate the cases from rheumatic myocarditis, and I hold th it is my duty to treat them as such for a period say, four to six months. If, at the end of this tin their condition is unaltered, and their electi cardiogram negative, the choice must be ma between valetudinarianism and the neglect of wh may turn out to be a serious cardiac lesion. mention these cases, because unfortunately this one of the groups where cardiac efficiency tests m fail—and often do. By tachycardia I mean a pul rate of 105 or over in a child of 10, which runs up 140 or more on exertion.

I am familiar with Sutherland's and Schlesinge work on the variation of pulse in the waking a sleeping child, and it may be that this method m be of service in helping us to estimate the activ of the cardiac lesion. I must say that the determi tion of cardiac efficiency, and the presence or abse of active carditis seems to me to be one of the m urgent problems in clinical medicine, and I thi it is one which may be solved eventually by simple cardiac methods described by Wing Co mander Treadgold and Squadron Leader Burton

I am, Sir, yours faithfully,

Harley-street, W., Feb. 12th, 1932. GERALD SLOT

X RAY DOSAGE IN MALIGNANT DISEAS

To the Editor of THE LANCET.

SIR,—In your issue of Jan. 31st (p. 254) refere is made to a discussion on this subject which to place at the Section of Radiology of the Royal Soci of Medicine on Jan. 15th. If I may be permitted criticise your annotation, it seems to me that t much stress is laid in it on the alleged oppositi

PUBLIC HEALTH SERVICES

LONDON COUNTY COUNCIL.

NUAL REPORT OF THE MEDICAL OFFICER OF HEALTH FOR 1930.

(Concluded from p. 162.)

EX-POOR-LAW HOSPITALS.

AT the end of 1930 the general hospital service mprised 27 acute hospitals, 13 hospitals and titutions for the chronic sick, 2 convalescent pitals, and 2 colonies for sane epileptics. The ite hospitals suffer from noisy surroundings, ufficiency of isolation wards, and lack of means the classification of patients. Ultimately some l have to be replaced by more modern buildings. the past some of these ex-poor-law hospitals have n overcrowded at a time when others had empty ls, owing to the legal obligation to provide treat-nt without delay for destitute persons. These pitals could not, like voluntary hospitals, select ir patients and close their doors when their beds re full, there has not been convalescent accommo-ion available for them, and the bed space per ient was generally too low. The demand for pital accommodation increases, and will increase re rapidly, now that the pauper restriction has n removed. There have also to be considered need for more adequate provision for the so-called ddle class, and the large increase in street casualties recent years. Sir F. Menzies pays a tribute to the endid work done by these poor-law hospitals, hough there was much variation in the policy rsued by the various boards of guardians. The blem now, put quite briefly, he says, is to find the t scheme for the prevention and treatment of ease of the people of London. The classification the many types of patients is a big task. For ample, some require dormitories, day-rooms, and rk-places; others dormitories and dining-rooms; ne must have their meals in the wards, and there sick children, maternity patients, and the blind d mental patients to be considered. At the time writing the report a comprehensive survey (outlined a previous article) was in progress in order to olve a scheme for the better utilisation of the commodation.

DISTRICT MEDICAL SERVICES.

These have been continued as before, pending view and consideration of the best system. There e 126 medical relief districts in the county, and 108 the district medical officers are part-time practi-ners under no medical supervision except in ackney, where the eight medical officers act under e supervision of the medical superintendent of the spital. In the remaining 18 districts, the district dical officer is a whole-time official acting under e supervision of the medical superintendent of the spital, and usually also a medical officer of the pital. In most of these ex-poor-law hospitals an t-patient department has arisen to deal with sualties, after-care of former in-patients, and pro-ion of antenatal and postnatal care for maternity [illegible]. For instance, out of 29 hospitals, 27 provide r casualties, 24 for the after-care of former in-atients, and 20 have antenatal clinics. It is ggested that in the future the scope of these out-atient departments will be extended.

MATERNITY AND INFANCY.

The quality of maternity accommodation in the transferred general hospitals varies from a fully equipped maternity block with 36 beds and 3 labour wards to quite primitive conditions. The wards at one hospital have been closed, and all maternity wards are being surveyed with a view to gradual improvement. The demand for maternity beds is increasing. The response from the patients to the establishment of antenatal clinics is remarkable, and these clinics have the advantage of being under the same roof as X ray and other departments. Before transfer, obstetrical consultants had been appointed to 9 of the hospitals, and the extension of this provision is being considered as part of the general question of supplying consultants for the council's hospitals.

The healthy children under 3 years in the Council's care at the end of the year numbered 706, of whom 442 were separated from their parents. These children require different accommodation in the first year of life, in the second year of life, and in the third year, when they are becoming more active and independent At the present time each nursery accommodates all three groups.

MENTAL.

The late boards of guardians had observation wards for mental patients in 21 hospitals and institutions. These wards on the whole fell short of the minimum standard for good classification and efficient treatment. Only 5 of the hospitals had a complete unit with two wards, day-room, airing court, and padded cells. In future schemes the aim will be to have larger and more efficient units. At present only 2 of the hospitals with mental wards have a mental specialist as consultant. Since September, 1930, trained mental welfare workers have been acting as home-visitors for two of these hospitals. X ray apparatus is or will be installed in most of the hospitals, and during the year Dr. Stanley Melville, who has been appointed consulting radiologist, has made a careful review of the plant in use. His report emphasises the fact that nowadays the radiologist at each hospital should be adequately trained and experienced in this special work.

ADMINISTRATION.

It is expected to effect considerable economies in the purchase of medical supplies, and a sample room has been set aside in the County Hall, where the contract standard samples and samples of instruments are available for inspection. Unusual and expensive instruments will also be kept in the sample room and be available for loan to the hospitals.

Special accommodation has been set aside for children suffering from chicken-pox, whooping-cough, mumps, and measles, and in order to deal with a long waiting-list of school-children needing operations for enlarged tonsils and adenoids arrangements have been made for these children to be operated upon in certain of the general hospitals. As regards convalescent accommodation, there are now available 500 beds at Queen Mary's Hospital, Sidcup, which was opened by Princess Mary in July, 1930; 320 beds at St. Benedict's Hospital, formerly known as Tooting Home; and the Council have acquired Heatherwood Hospital, Ascot (136 children's beds), from the United Services Fund, along with its obligation to the children of ex-Service men.

THE SERVICES

ROYAL ARMY MEDICAL CORPS.

Lt. (on prob.) H. V. Tighe resigns his commn.

C. W. A. Kimbell is granted a temp. commn. in the rank of Lt.

ARMY RESERVE OF OFFICERS.

Capt. N. H. Smith, from Supp. Res. of Off., to be Capt.

TERRITORIAL ARMY.

Lts. R. I. Poston and W. F. Mulvey to be Capts.

INDIAN MEDICAL SERVICE.

The undermentioned appts. are made:—To be Capts. (on prob.): Capt. R. A. Wesson, W. Happer, and J. J. Quinlan. To be Lts. (on prob.): R. J. Jarvie, F. A. B. Sheppard, P. E. Sweeney, M. Sendak, and W. A. N. Marrow.

ROYAL AIR FORCE.

R. L. Raymond is granted a short service commission as a Flying Officer for three years on the active list.

ROYAL AIR FORCE RESERVE.

The undermentioned Flying Officers are promoted to the rank of Flight Lt.: W. J. Hutchinson, D. Magrath, W. A. Beck, and M. D. Rawkins.

DEATHS IN THE SERVICES.

Lt.-Col. Charles George Spencer, late R.A.M.C., died at Queen Alexandra Military Hospital on Feb. 8th, aged 63. A graduate of the University of London, he joined the medical department of the Army as Lt. in 1893, and served in the Ashanti Expedition of 1895–96 (Star) and in China in 1900 (medal). In 1905, when he had reached the rank of Major, he became professor of military surgery at the Royal Army Medical College, a post which he held till 1910. He retired from the service three years later, but was recalled to the active list on the outbreak of war in 1914. Lt.-Col. Spencer was the author of Gunshot Wounds, a book, published in 1908, which showed keen observation and care, and which has been found useful by the civil practitioner as well as the military officer. He also contributed to Choyce's System of Surgery and to Latham and English's System of Treatment, and made some useful communications to the medical press.

Dr. A. F. H. Stewart, M.O., St. Vincent, has been appointed Government M.O., Trinidad.

OBITUARY

WILLIAM BILLINGTON, M.S. Lond., Ch.M. Birm., F.R.C.S. Eng.

THE Birmingham School and the Queen's Hospital in particular has suffered another severe blow in the death on Feb. 7th of Mr. William Billington, professor of surgery in the University and senior surgeon to the hospital. He had been in failing health for several months past, but in spite of increasing disability he carried on his work courageously almost to the last.

William Billington was born at Sandbach, Cheshire, in 1876, was educated at the grammar school there and then at Wellington (now Wrekin) College, Salop, where he became head of the school and secretary to its master and founder, Sir John Bayley. He began his medical study with a scholarship at Mason College, where he gained numerous distinctions including that of Ingleby scholar in gynæcology. In 1899 he graduated M.B. Lond., with first-class honours and the Gold Medal in gynæcology. After serving as house physician to Dr. Arthur Foxwell, he was then in succession house surgeon to Prof. Jordan Lloyd at the Queen's, and resident pathologist at the General Hospital. In 1902, after some post-graduate study in London and taking higher surgical diplomas, he was appointed surgeon to out-patients at the Queen's, becoming full surgeon in 1913. In the following year he joined the staff of the 1st Southern General Hospital, with charge of the centre for jaw and facial injuries. Here, in coöperation with his dental colleagues, Mr. Harold Round and Mr. A. H. Parrott, he did much bone-grafting of the lower jaw and facial repair, original work which was not only of value to wounded soldiers, but has proved equally beneficial in civilian practice.

PROF. BILLINGTON.

[*Photograph by H J. Whitlock.*

Mr. Billington was largely instrumental in founding, in 1913, St. Chad's Hospital, the first institution of the kind in the country, to provide expert medical and surgical treatment and skilled nursing for the large class of patients who cannot afford high fees and yet do not wish to go into the public hospitals. Practica experience there convinced him that with prope organisation paying hospitals can be made a succes and satisfy consultant, practitioner, and patient He devoted much time and thought to hospital administration. As chairman of the medical committee of the Queen's Hospital, he took a leading part in its extension, and in raising the necessary funds. He worked untiringly and unselfishly in support of the proposed University hospital centre.

In 1924 came his appointment to the University chair of surgery. He had long been known as a clear convincing speaker—in 1911 he had delivered a series of addresses on surgical topics in the United States of America—and as an able and lucid teacher of students. He was popular with his classes, and a pillar of strength in the medical school. As a surgeon he was cool and dexterous; his technique was neat with a scrupulous regard for detail. He had made a special study of movable kidney and devised a new method of renal fixation. He had also a large experience of chronic ulcer of the body of the stomach for which he advocated a trial of double gastro-enterostomy combined with entero-enterostomy. As a colleague he was helpful in advising and guiding his juniors. Outside the hospital he had a large consulting practice which left him little leisure for other pursuits, but he loved the country and enjoyed an occasional day's shooting or fishing.

In 1906 Mr. Billington married Miss Winifred Cooke, of Edgbaston. Their daughter and two of three sons are studying for the medical profession.

PARLIAMENTARY INTELLIGENCE

NOTES ON CURRENT TOPICS.

ANGEROUS DRUGS ACTS AMENDMENT.

x the House of Lords on Thursday, Feb. 11th, ill was introduced to amend the Dangerous Drugs s. The measure was read a first time.

CHILDREN AND YOUNG PERSONS BILL.

n Friday, Feb. 12th, the House of Commons sidered the Children's and Young Persons Bill. Ir. **Oliver Stanley**, Under-Secretary for Home airs, in moving the second reading of the measure, l that its main object was to amend the existing contained in the Children Act, 1908, and other tutes relating to the protection of neglected dren and young persons and the treatment of ng offenders. The Bill would make a beneficial ration in the social life of the country by which was hoped to reduce the criminal population. had to confess that the measure was one of the st examples of legislation by reference that he l ever seen. It was intended that it should be owed by a Consolidating Act in which could be hered together all the provisions dealing with the ld and the young offender. Under the Bill there ld be magistrates chosen from a special panel, cted for their knowledge and of interest in work his kind. It would be left to the Lord Chancellor rescribe rules for the selection of a special panel of gistrates to sit in Juvenile Courts, and a special irman to preside. Great importance was attached the separation in venue of the Juvenile Court n the Adult Court. The right of the parent to ect to a child being dealt with in a Juvenile Court s to be done away with, but the right of the young son to object himself and to claim to be tried in ther place would remain. Special arrangements e made in regard to the Metropolitan courts. Bill extended the jurisdiction of juvenile courts r young offenders, raising the age from 16 to 17. change was made in the case where a young son charged with an adult was tried in an adult rt, but power was given to the adult court to nit the young offender to a juvenile court for tment.

WHIPPING.

ne of the most important changes was the lition of certain powers of the court to order ipping. There was no mention of whipping in Bill at all, but power would still remain to send boy over 14 to Quarter Sessions to be tried on charge where Parliament had made whipping statutory punishment. Whipping as a punishnt had been falling into disuse. The annual res of whipping had fallen from 2079 in 1913 to y 130 in 1930, and although these figures had been lysed it was quite impossible to trace the residue any particular crime that would enable then to that the magistrates' experience had shown that, hough whipping might not be an adequate punishnt in all circumstances, it was useful under this that conviction. There was all the difference in world between being whipped by a school-master being idle and being whipped by a policeman. ear, hear.) It was one of the most revolutionary posals of the Act of 1908 that for the first time it owed the courts to entertain the cases of children o had committed no offence but whose circumnces made it desirable that they should receive tection. This right was given in respect of children to the age of 16, with regard to specific categories home circumstances, including destitution, drunken nts, sexual offences, prostitution, or wandering thout parental control. By this Bill it was proposed extend the age from 16 to 17 and to abolish those cial categories and substitute for them one wide definition which would bring in a number of cases that were brought in to-day only by a very great strain of the law. There was no question of ignoring the parent and substituting the State, because the fundamental basis of these cases was that parental control had been abdicated.

REFORMATORY AND INDUSTRIAL SCHOOLS.

The Bill also provided an alteration in connexion with the reformatory and industrial schools, which in future would be known as "approved" schools. Both these types of school were now connected with the State, and both could be used. The industrial school could be used for neglected children, for offenders under 12, or for first offenders up to 14; the reformatory school must be for all other types of offenders. The distinction between the two types of school was largely artificial; both classes of children had to suffer the withdrawal of their liberty, and it was proposed to abolish the distinction between the two types of school and put them both under the head of "approved" schools. The period of detention in future would be automatic. For a child under 14 it would be for three years, or in any case until the child had reached the age of 14; in the case of the young person it would be for three years, but not in any case beyond 19. For both children and young persons it would be possible, with the assent of the Home Secretary, to detain them for another six months, if they required further vocational training before it was possible to find them employment. This automatic period would give a chance of experiment in short term detention in the schools. The Home Secretary would have power to license at any time after six months, and it was intended to try with the most suitable type a short period of training for six months, or some period of that kind.

STREET TRADING.

Part III. of the Bill gave effect to the recommendations made in the third report of the Child Adoption Committee for the registration and inspection of voluntary homes. Part IV., which dealt with the employment of children and young persons, was largely reprinted from the Education Act, 1921, with minor drafting amendments. There was one alteration of some importance which affected street trading. Under the Education Act, 1921, street trading was prohibited up to the age of 14, and regulated by the education authorities between the ages of 16 and 18. It had been decided not to regulate under this Bill the employment of boys and girls in unregulated employment. He recognised that that would cause disappointment in some quarters, but this question was not related in any way to the purposes of the Bill. It was estimated that the Bill would save the State £8000 a year. (Cheers.)

OMISSIONS REGRETTED.

Mr. R. J. **Davies** said that the Opposition welcomed the Bill. He regretted that the Bill did not provide for the establishment of observation centres which have produced very good results in Belgium.

Viscountess **Astor** said she regretted that the Government have not included in the Bill some of the recommendations of the committee on sexual offences against young persons. That type of crime was increasing, and those guilty of it often received inadequate sentences. It was estimated that 400,000 children were employed in unregulated trades, and some of them worked 72 hours a week. She thought that they ought to fight the opposition of people who wanted to make money by employing children for 72 hours a week. The House of Commons ought to insist on the hours of employment of children between the ages of 14 and 16 being regulated.

Dr. **Salter** said he understood that great efforts

The hours of awakening patients at the 28 general hospitals were found to vary considerably. At ten of them patients were awakened at or before 5 A.M. It is now proposed that the awakening hour should not be before 6 A.M., and that all hospitals should be raised to this standard as staff becomes available. Incidentally, the report shows that the settlement of standard conditions for the various grades of nurses has already had its effect in increasing the applications for entry as probationers in the Council's service. The creation of a nursing staff common to the whole of the Council's hospitals has provided wide facilities for training and experience and opportunities for promotion more extensive than those in any comparable service.

EX-M.A.B. HOSPITALS.

Sir F. Menzies points out that when the special hospitals were transferred from the M.A.B., the Council took over a highly organised system of hospitals, the administration of which had, as a result of a natural process of development over a long period of years, been coördinated, and that all that was necessary was to adapt the methods under which they had been administered to the Council's system, a comparatively simple process. Amongst the research work in progress at the infectious hospitals are a trial of vitamin A concentrate in the prevention of secondary infections, such as middle-ear disease, under the supervision of Prof. S. J. Cowell; a trial of the aspiration method of treating laryngeal diphtheria, and the study of the heart in diphtheria by means of the electrocardiograph. Convalescent serum is in successful use for the prevention of measles, and encouraging results are reported from the treatment of parkinsonian cases with the dried extract of stramonium (U.S.A. pharmacopœia). Cases of acute poliomyelitis are sent to the Western Hospital, and the absence of any epidemic prevalence during the year is indicated by the fact that only five cases were admitted. Small-pox cases admitted to the "River hospitals" numbered 6170, of whom 19 died. Nine babies were born in hospital; 35 babies not suffering from small-pox were admitted with variolous mothers, and five mothers not suffering from small-pox with variolous babies. During the year four cases of acute encephalomyelitis occurred, of which one only had been recently vaccinated. Mr. M. S. Mayou, F.R.C.S., reports that 196 babies and 113 mothers were admitted to St. Margaret's Hospital for ophthalmia neonatorum. The number of damaged eyes was less, but still "far too many." Some cases are admitted with the cornea damaged by too strong nitrate of silver or perchloride of mercury. Many midwives visited the institution during the year, but not a single medical student. Mr. Mayou deplores the absence of the latter.

SYPHILITIC MOTHERS.

Mr. John Adams, F.R.C.S., reports on the work of Thavies' Inn V.D. Hospital. Three patients were confined of macerated babies a few days after admission. All babies born from syphilitic mothers were discharged with a negative Wassermann test, except four, who left within a month. Of the latter, two had out-patient treatment and became negative, and the other two were lost sight of. Many children born of syphilitic mothers have been under observation since 1917, and had blood tests from time to time. All have appeared healthy, and none has shown any signs of syphilis.

TUBERCULOSIS.

Dr. James Watt, chief medical officer, tuberculosis service, reports that 3228 cases of pulmonary tuberculosis were admitted to the hospitals, and that the average duration of stay was longer than in the previous year. He states that in other countries the duration of stay in hospital is 50 per cent. longer than in England. The recognition during the last ten years of the poor after-results of sanatorium treatment, he says, has led to a revision of methods. A much larger proportion of cases are being treated by surgical methods, and when it is more widely recognised that thoracoplasty, generally reserved for hopeless cases, gives as high a proportion of cases alive after five years, as ordinary sanatorium treatment can give for all cases, early and advanced, it is certain to be used more extensively. He also refers to the promising results obtained from the injection of gold salts, and to the need for further research as to the action of this remedy and the best dosage. He recommends the institution of out-patient clinics at certain of the Council's hospitals for the continuance of pneumothorax treatment. The immediate results of treatment on discharge from Pinewood and King George V. Sanatorium were apparently satisfactory, but, if we are to judge by past experience, 50 per cent. of the patients will die within five years, and only 25 per cent. be fit for work. It may be, he thinks, we have paid too much attention in the past to the disappearance of symptoms and physical signs, and too little to X ray pictures of the condition of healing of the lungs.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDE

FEB. 6TH, 1932.

Notifications.—The following cases of infectiou disease were notified during the week:—Small-po 57 (last week 49); scarlet fever, 1485; diphtheri 1015; enteric fever, 36; pneumonia, 1742; puerpera fever, 55; puerperal pyrexia, 99; cerebro-spin fever, 48; acute poliomyelitis, 6; acute poli encephalitis, 4; encephalitis lethargica, 7; continue fever, 1; dysentery, 20; ophthalmia neonatorum, 9 No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on Feb. 9th–10th was as follows: Small-pox, 105 under treatment, 4 under observation (last week 110 and 3 respectively); scarlet fever, 1199; diphtheria, 1502; enteric fever, 10; measles, 905; whooping-cough, 334; puerperal fever, 13 (plus 10 babies), encephalitis lethargica, 220; poliomyelitis, 4; "other diseases," 241. At St. Margaret's Hospital there were 15 babies (plus 9 mothers) with ophthalmia neonatorum.

Deaths.—In 117 great towns, including London, there was no death from small-pox or enteric fever, 44 (15) from measles, 7 (1) from scarlet fever, 50 (11) from whooping-cough, 36 (7) from diphtheria, 53 (8) from diarrhœa and enteritis under two years, and 278 (81) from influenza. The figures in parentheses are those for London itself.

The reported deaths from influenza are still falling, but the total deaths for the year so far amount to 1732 against 1126 for the corresponding period of 1931. Of the great towns Birmingham again stands highest with 12 deaths from influenza, Manchester following with 8, Croydon, Bradford, Sheffield, and Swansea, each with 6. Manchester reported 11 deaths from measles, Stoke-on-Trent 5. Whooping-cough accounted for 4 deaths at Liverpool, 3 at Manchester.

The number of stillbirths notified during the week was 273 (corresponding to a rate of 41 per 1000 births), including 41 in London.

MONDAY, FEB. 15TH.

Sterilisation of the Mentally Unfit.

Captain WATT asked the Minister of Health if. in view of e social evil arising out of unrestricted propagation amongst entally defectives and the consequent increase in the umber of such persons, he was prepared to investigate the estion of the sterilisation of the mentally unfit and. desirable. to introduce legislation to eradicate the evil.—r. ERNEST BROWN (Parliamentary Secretary to the inistry of Health) replied: The desirability of legislation ould not, in my right hon. friend's view. be determined ntil there has been a full and authoritative inquiry into he problems of mental deficiency. in which sterilisation is nly one of several inter-related questions. But as a st step towards such an inquiry, my right hon. friend oposes to arrange for a preliminary investigation of the ientific issues involved.

Dr. MORRIS-JONES asked if the right hon. gentleman would nounce the names of the members of the Committee, d Mr. Brown replied that he had nothing to add to his swer.

Sale of Proprietary Medicines.

Sir JOHN HASLAM asked the Secretary to the Treasury he was aware that certain makers of proprietary medicines ered their products to the public at one fixed retail ice, although in certain cases the goods bore no patent edicine stamp and in other cases the self-same article had e full Government stamp; and whether he would take eps to prevent this evasion of the law and loss of public venue.—Major ELLIOT (Financial Secretary to the Treasury) plied: I assume that my hon. friend is referring to cases ere a medicine is sold unstamped by duly qualified emists and druggists under the conditions of the statutory emption from Medicine Stamp Duty in favour of "known, mitted, and approved of" remedies but is properly amped when sold by other persons than qualified chemists d druggists. I would explain that the question of the ices charged is not a matter in which I can interfere and am not aware of any infringement of the law in such cases.

TUESDAY, FEB. 16TH.

Alleged Illegal Detention of a Girl.

Mr. WEDGWOOD asked the Minister of Health whether s attention had been called to a recent case of illegal etention of a so-called mentally deficient girl; whether y other persons were detained by the same people; and at was the practice with regard to inspection of homes for phans or feeble-minded persons.—Mr. E. BROWN (Parliamentary Secretary to the Ministry of Health) replied: y right hon. friend's attention has been called to the case. is girl was not certified as mentally defective, nor regarded subject to be dealt with under the Mental Deficiency Act. ere is no evidence that other persons are being detained the same people. All premises certified for the reception mental defectives are regularly inspected by the Board of ontrol.

MEDICAL NEWS

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niversity of Cambridge.

On Feb. 13th, the following degrees were conferred:—
M.D.—C. F. Brockington.
B.Chir.—G. D. Kersley and T. C. Larkworthy.

oyal College of Physicians of Ireland.

At a meeting of the College on Feb. 5th the following were dmitted to membership: James Andrew Donnelly Deeny. D., Gerald Cecil Dockeray. M.B., Vincent Cornelius lis, *M.D.*, Maurice Fitzgerald Nash Griffin. R.A.M.C., nna Mary Elizabeth McCabe, M.B.. Desmond Kyran lrany, M.B., Gerard Thomas O'Brien. L.R.C.P., and lan Herbert Thompson, M.B.

ritish College of Obstetricians and Gynæcologists.

At a recent meeting of the Council, with Prof. W. Blair ll, the President, in the chair, the following Members re elevated to the Fellowship: John Hewitt, Frederick thur Maguire, Donald McIntyre. Wilfred Shaw, and rry Keyte Tenison Collins.

The following were elected Members: Emily Grace th Baillie, *Arthur Capel Herbert Bell, Caroline Anne tt, Elinor Drinkwater Jackson, David Johannes lan. Louisa Martindale, *William George Richards, d *Albert Sharman.

* By examination.

Royal College of Surgeons of England.

At a meeting of the Council on Feb. 11th. with Lord Moynihan, the President. in the chair. diplomas of membership were conferred on 129 candidates. whose names were given in our issues of Feb. 6th and 13th as recipients of the L.R.C.P. (with the exception of G. Ashton. H. F. Bateman, and E. A. Knappett).

Diplomas in public health were granted jointly with the Royal College of Physicians to the candidates whose names appeared in our issue of Feb. 6th.

Sir Percy Sargent was appointed Bradshaw lecturer. and Mr. Francis Weston. F.S.A., past Master of the Barbers' Company, Thomas Vicary lecturer for the ensuing year. Mr. Victor Bonney was reappointed representative of the College on the Central Midwives Board for the period of one year from April 1st, 1932.

The gift of a silver bowl. presented by Sir George Makins, Past President of the College. was reported.

The Chester Royal Infirmary was recognised for the 12 months' surgical practice required of non-members before admission to the Final Fellowship Examination.

The President reported that an election of three Fellows into the Council would take place on Thursday. July 7th next, at 11 A.M. in the vacancies occasioned by the retirement in rotation of Mr. W. McAdam Eccles, Mr. Wilfred Trotter. and Sir Charles Gordon-Watson: that notice of the election would be given to the Fellows by advertisement and by circular on March 11th; and that March 21st would be the last day for the nomination of candidates. and that a voting paper would be sent on April 6th to every Fellow of the College whose address was registered at the College.

Industrial Health Education Society.

The annual meeting of this society will be held at the B.M.A. House. Tavistock-square. W.C., at 4 P.M. on Tuesday. Feb. 23rd. The speakers will be Sir Thomas Horder (the President). Lord Luke. and Sir William Haldane.

Society of Medical Officers of Health.

A meeting of the Fever Group of this society will be held at 1. Upper Montague-street. Russell-square. London. W.C.. on Friday. Feb. 26th. at 4 P.M. A paper will be read by Dr. R. Armstrong on the Serum Treatment of Pneumonia. All interested in the subject are invited to attend.

Society for the Study of Inebriety.

The annual meeting of this society will be held at 11. Chandos-street. London, W.. at 4 P.M.. on Tuesday, April 12th. Dr. J. D. Rolleston will open a discussion on the Cigarette Habit.

Hunterian Society.

Award of the Gold Medal for 1932.—The Examination Committee which met on Jan. 28th was unanimous in awarding the medal to Griffith Ifor Evans. D.M. Oxf., F.R.C.S. Eng., of Caernarvon for an essay entitled "Chronic Familial Syphilis": Gwladys Victoria Smallpiece, M.D., M.R.C.P. Lond.. proxime accessit. The next award of the medal will be made in 1933 for essays received on or before Dec. 31st. 1932. The competition is open to all general practitioners in Great Britain. Ireland, and the Channel Islands. Particulars from the Hon. secretaries. Dr. D. C. Norris. 14. City-road. E.C.1. and Mr. Andrew McAllister, 79, Wimpole-street. W.1.

The *Annual Dinner* of the Society was held on Feb. 11th. at the May Fair Hotel, the President, Dr. David Ross. being in the chair. After the loyal toasts the memory of John Hunter was toasted in silence. Lord Meston. Chancellor of Aberdeen University. proposed "The Hunterian Society," remarking on the revolution in the practice of surgery brought about by Hunter through sheer force of intuitive genius. Dr. Ross in reply. admitted the importance of the Hunterian Society in carrying on the spirit of Hunter. "We are confident," he said. "that we are a great Society," adding. as a good Aberdonian himself. "This is a great night for Aberdeen, with the Chancellor and Rector of its University (Sir Arthur Keith) both present." At the end of his remarks he handed the Society's gold medal designed by Mr. Thornton Shiells. to Dr. Griffith Evans. and circulated a plaque of the medal presented by the honorary treasurer. Dr. Irwin Moore. Sir Thomas Carey Evans proposed "The Lord Mayor and Corporation of the City of London," and Sir Maurice Jenks in reply said how proud the City was of its association with Hunter and the Hunterian Society. Dr. D. A. Coles proposed "The Guests and Kindred Societies" to which Mr. Justice McCardie and Col. C. T. Samman, late Master of the Apothecaries' Society. replied. Sir Arthur Keith added a few graceful words. remarking that. if Hunter himself. "that red-haired and rather quarrelsome man from Scotland," had been present. he might not have been instantly appreciated by the company; but. he added. he was a man who looked deeply into life and his greatness is still being disclosed.

were to be made during the later stages of the Bill to secure the repeal of Section 120 of the 1908 Act which prohibited the admission of children to public house bars. He urged the Government to resist to the utmost any amendment of the law in that direction.

After further debate, the Bill was read a second time.

The financial resolution in connexion with the Bill was agreed to in Committee.

VETERINARY SURGEONS (IRISH FREE STATE AGREEMENT) BILL.

The Veterinary Surgeons (Irish Free State Agreement) Bill, a measure to confirm and give effect to a certain agreement made between His Majesty's Government in the United Kingdom and His Majesty's Government in the Irish Free State with respect to the registration and control of veterinary surgeons, passed through Committee in the House of Lords on Tuesday, Feb. 16th, without amendment.

IMPORT DUTIES BILL.

The second reading of the Import Duties Bill was debated in the House of Commons on Monday, Feb. 15th, and Tuesday, Feb. 16th. The measure applies a 10 per cent. *ad valorem* tariff to imports into this country with the exception of a free list of articles detailed in the first schedule, including wheat in grain, meat—i.e., beef, veal, mutton, lamb, pork, bacon, ham, and edible offals, but not including extracts and essences of meat or meat preserved in any air-tight container—fish of British taking, including shell-fish, tea, newspapers, periodicals, printed books, raw rubber, rubber latex, gutta percha and balata (raw), sulphur, mineral phosphates of lime, and radium compounds and ores.

On the conclusion of the second day's debate the motion for the rejection which had been moved by Mr. LANSBURY on behalf of the Opposition was negatived by 451 votes to 73—majority, 378. The Bill was then read a second time.

HOUSE OF COMMONS.

THURSDAY, FEB. 11TH.

Anthracosis and Silicosis.

Sir WILLIAM JENKINS asked the Home Secretary what progress had been made to get anthracosis scheduled in the workmen's compensation regulations in order to secure payments for men suffering from this disease in the mining industry.—Sir HERBERT SAMUEL replied: It has not been established that work in the anthracite mines is a cause of special pulmonary disease. The question of the effect of coal dust on the lungs has been referred to the Pulmonary Diseases Committee of the Medical Research Council for investigation, and it has been found that there are serious technical difficulties in prosecuting the researches necessary for determining the question. I am informed that it is receiving the close attention of the Medical Research Council, but I am sorry I cannot say when the work is likely to be brought to completion.

Sir WILLIAM JENKINS asked the Home Secretary what number of men had claimed compensation who were suffering from silicosis in South Wales; the number who succeeded in their claim; and the number refused, if any, and upon what grounds.—Sir HERBERT SAMUEL replied: Separate figures for South Wales as not available, but the Returns for Great Britain show that in 1929 there were 12 cases, and in 1930 18 cases of coal-miners who recovered compensation for disablement from silicosis. The Returns for 1931 are only now being collected. I regret that I am not in a position to give the total number of claims made or refused, or the reasons for refusal.

Dust as Factor in Crime Detection.

Mr. ROBINSON asked the Home Secretary whether his attention had been drawn to the scientific investigations made by foreign police experts into the analysis of dust as a factor in crime detection; in particular, whether he was aware of the work of Dr. Edmond Locard, of Lyon; and whether the Metropolitan police had adopted or investigated the methods advocated, and with what results, in any recent crimes.—Sir HERBERT SAMUEL replied: Yes, Sir. The Commissioner has continual and careful watch kept upon all developments in the scientific side of criminal investigation and has had his attention called to the work of Dr Locard and many others. The Metropolitan police employ the best experts in the particular subject whenever it appears that scientific assistance is likely to be helpful. Careful scientific examination of dust is made wherever necessary, and although such cases are rare, the best technical assistance has been obtained whenever there has been grounds for supposing that it was likely to be of value.

Nursery Schools.

Mr. DAGGAR asked the President of the Board of Education how many new nursery schools had been opened and how many plans had been approved from July 1st, 1929, to August, 1931; and how many had been opened and plans for others approved since that date.—Sir DONALD MACLEAN replied: Between the beginning of July, 1929, and the end of August, 1931, 18 nursery schools were recognised for the first time by the Board of Education. In 13 of these cases the plans had been approved during the same period. Since the end of August, 1931, 5 further schools have received recognition, plans in all these cases having been approved before that date and after July, 1929. Plans for 10 further schools were approved between the beginning of July, 1929, and the end of August, 1931, and for one further school since the latter date. Apart from one voluntary proposal which has been abandoned, most of these 11 schools are either already opened though not yet formally recognised, or are approaching completion.

Viscountess ASTOR asked the President of the Board of Education whether he was aware that the Bradford Elementary Education Subcommittee had decided to cut down the milk supply of children in nursery schools to one-third of a pint per day, in spite of the fact that over 50 per cent. of the children in the Bradford Nursery School were on the free lists, which meant a poverty basis and very little milk supplied in their homes; and whether he would issue a circular to all education committees giving the opinion of the Medical Research Council on the subject and requiring the issue of the correct quantity of milk to all children.—Sir DONALD MACLEAN replied: I have no official information as to any changes made by the Bradford Local Education Authority in the matter of the supply of milk to children in their nursery schools, but I have seen a statement in the press that certain modifications had been made on an experimental basis to be reconsidered next April. The Board's regulations in regard to nursery schools require that adequate arrangements must be made for attending to the nourishment o the children, and I am staisfied that this requirement i being generally met, not only by the provision of milk but normally by the supply of good dinners also, and I d not therefore think that it is necessary to issue a circula to local education authorities on the subject.

Staffing of Oldchurch Hospital.

Mr. HUTCHISON asked the Minister of Health whethe he could investigate the staffing of the Oldchurch Hospita at Romford, where recently an attendant lost his life i the execution of his duty by being attacked by an insan patient; whether the staff was adequate for the purpose; and whether he was aware of the dissatisfaction of the staff with the conditions of working and with the obsolete character of the buiding.—Sir E. HILTON YOUNG replied: Yes, Sir. I have asked for a report upon these matters. Pending the receipt of that report my hon. friend will, I am sure, not expect me to express any opinion in regard to the subject matter of the second part of the question.

Imports of Liquid Milk.

Brigadier-General CLIFTON BROWN asked the Minister of Health who were the principal importers of liquid milk during the last three months who were registered by the port sanitary authorities of London, Harwich, and Newhaven; and whether any of the liquid milk imports came in pasteurised.—Sir E. HILTON YOUNG replied: It is compulsory for importers of liquid milk to be registered with the Local Authority under the Public Health (Imported Milk) Regulations, and I do not think that I could properly give a list of the names of persons thus required to be registered. With regard to the last part of the question, there is reason to believe that most, if not all, the imported milk in question is heat treated before shipment.

The Spahlinger Treatment.

Mr. HAMMERSLEY asked the Minister of Health what reports he had received from his officials on the publication by Spahlinger of his formula for the treatment of tuberculosis.—Sir E. HILTON YOUNG replied: I have received from M. Spahlinger a copy of his statement as issued to the press, and I am considering it. I have also sent copies of the statement to the Medical Research Council and other competent research bodies for their observations.

Demonstration in Surgery. 2 P.M., Operations, Medical Surgical, Throat Out patients.

WEDNESDAY.—10 A.M., Medical Wards, Children's Medical Out-patients. 2 P.M., Gynæcological Operations, Medical, Surgical, and Eye-Out-patients. 4.45 P.M., Venereal Diseases.

HURSDAY.—10 A.M., Neurological Out-patients. 11.30 A.M., Fracture Demonstration. 2 P.M., Operations, Medical, Surgical, Eye and Genito-urinary Out-patients.

RIDAY.—10 A.M., Medical, Wards, Skin Out-patients, Dental Department. 12 noon. Medical Lecture. 2 P.M., Medical, Surgical, and Throat Out-patients Operations.

ATURDAY.—9 A.M., Throat Operations. 10 A.M., Medical Wards, Children's Medical Out-patients, Surgical Out-patients.

S HOSPITAL, London Bridge, S.E.

ONDAY, Feb. 22nd.—5 P.M., Dr. A. E. Barclay: The Use of X Rays in Physiological Investigation.

AL NORTHERN HOSPITAL, Holloway-road, N.

UESDAY, Feb. 23rd.—3.15 P.M., Dr. C. C. Beatty: Misleading Symptoms.

ERSITY COLLEGE HOSPITAL MEDICAL SCHOOL, ersity-street, W.C.

UESDAY, Feb. 23rd.—5.15 P.M., Dr. Dorothy Russell: Intracranial Tumours.

RING CROSS HOSPITAL MEDICAL SCHOOL.

UNDAY, Feb. 21st.—10.45 A.M., Mr. W. H. McMullen: Headaches Associated with Ocular Defects. 11.45 A.M., Mr. Norman C. Lake: The Diagnosis of Gastric and Duodenal Ulcer.

S COLLEGE HOSPITAL MEDICAL SCHOOL, mark-hill, S.E.

HURSDAY, Feb. 25th.—9 P.M., Dr. M. Critchley: Precocious and Premature Old Age.

H-WEST LONDON POST-GRADUATE ASSOCIA- ON, St. James' Hospital, Ouseley-road, Balham.

WEDNESDAY, Feb. 24th.—4 P.M., Mr. V. Z. Cope: Demonstration of Surgical Cases.

RAL LONDON THROAT, NOSE, AND EAR HOS- TAL, Gray's Inn-road, W.C.

RIDAY, Feb. 26th.—4 P.M., Mr. N. Asherson: Complications of Tonsillectomy.

PITAL FOR EPILEPSY AND PARALYSIS, Maida e, W.

HURSDAY, Feb. 25th.—3 P.M., Dr. Wilfred Harris: Demonstration of Cerebral Tumours.

PSTEAD GENERAL AND NORTH-WEST LONDON SPITAL.

WEDNESDAY, Feb. 24th.—4 P.M., Mr. W. H. Ogilvie: Common Injuries of the Wrist and their Treatment.

, OF LONDON MATERNITY HOSPITAL, City-road,

THURSDAY, Feb. 25th.—5.30 P.M., Mr. R. Christie-Brown: General Principles in the Treatment of Hæmorrhage as applied to Obstetrics.

ETER'S HOSPITAL, Henrietta-street, W.C.

WEDNESDAY, Feb. 24th.—3 P.M., Mr. J. A. Andrews: Enlarged Prostate.

ARK'S HOSPITAL, City-road, E.C.

THURSDAY, Feb. 25th.—4.30 P.M., Dr. Norman P. Henderson: Opaque Enema: Technique, Value, Difficulties, Interpretation.

JOHN'S HOSPITAL DERMATOLOGICAL SOCIETY.

WEDNESDAY, Feb. 24th.—4.15 P.M. (at St. John's Hospital, 49, Leicester-square, W.C.), Clinical Cases.

IONAL COUNCIL FOR MENTAL HYGIENE.

WEDNESDAY, Feb. 24th.—5.30 P.M. (at 11, Chandos-street, W.), Dr. E. B. Strauss: The Borderline Case.

AL INSTITUTE OF PUBLIC HEALTH, 37, Russell-square, W.C.

WEDNESDAY, Feb. 24th.—4 P.M., Dr. W. S. C. Copeman: Control of Industrial Rheumatic Diseases in the Future.

DON SCHOOL OF DERMATOLOGY, St. John's Hospital, Leicester-square, W.C.

TUESDAY, Feb. 23rd.—5 P.M., Dr J A Drake: Leprosy.

THURSDAY—5 P.M., Dr. J. E. M. Wigley: Leukæmia Cutis. Mycosis Fungoides.

VERSITY COLLEGE, Gower-street, W.C.

FRIDAY, Feb. 26th (and following MONDAY and TUESDAY), 5.15 P.M., Prof. A. J. Clark: Reaction Between Drugs and Cells.

OATS HOSPITAL, Manchester.

THURSDAY, Feb. 25th.—4.15 P.M., Dr. W. J. S. Reid: Microcytic Anæmia.

CHESTER ROYAL INFIRMARY.

TUESDAY, Feb. 23rd.—4.15 P.M., Dr. A. Ramsbottom: Some Points in the Diagnosis and Treatment of Pleural Effusion.

FRIDAY.—4.15 P.M., Mr. J. Morley: Demonstration of Surgical Cases.

CHESTER ROYAL INFIRMARY.

TUESDAY, Feb. 23rd.—4.15 P.M., and following FRIDAY at the same hour: Clinical Cases in the Wards.

MARY'S HOSPITALS, Manchester.

FRIDAY, Feb. 26th.—4.15 P.M. (at the Whitworth-street West Hospital), Dr. J. F. Ward: Some Problems in Infant Feeding.

ULTY HALL, St. Vincent-street, Glasgow.

TUESDAY, Feb. 23rd.—4 P.M., Dr. J. Cowan: Arterial Disease.

AL SAMARITAN HOSPITAL FOR WOMEN, Glasgow.

WEDNESDAY, Feb. 24th.—4.15 P.M., Dr. D. McIntyre: Gynæcological Cases.

Vacancies

For further information refer to the advertisement columns.

Aberdeen Royal Mental Hospital.—Jun. Asst. Phys. £300.

Antrim Mental Hospital, N. Ireland.—Res. Med. Supt. £800.

Assam.—M.O. for Tea Estates Rs.1500 a month.

Ayr County Hospital.—H.S. £150.

Birmingham, General Hospital.—Res. Surg. Reg. £100–£120–£140.

Birmingham, Maternity and Child Welfare Dept.—Res. M.O. £250.

Birmingham, Queen's Hospital.—Ophth. H.S. and Res. Anæsthetist. £70–£100.

Blackburn, Calderstones (Certified Institution for Mental Defectives) Whalley.—Asst. M.O. £500.

Bootle General Hospital, Nr. Liverpool.—Cas. O. and H.S.'s. Each at rate of £150.

Brighton Education Committee.—Asst. School M.O. and Asst. to the M.O.H. £500.

Bristol Eye Hospital.—Hon. Asst. Surgeon.

British Medical Association.—Asst. Med. Secy. £800.

Cambridge, Addenbrooke's Hospital.—Three H.S.'s to Special Depts. Each at rate of £130.

Cambridge University.—E. G. Fearnside Scholarship for Clinical Research, &c.

Cancer Hospital, Fulham-road, S.W.—H.S. At rate of £100.

Carlisle, Cumberland Infirmary.—H.P. 2nd H.S. and H.S. to Spec. Depts. Each £155.

Central London Throat, Nose, & Ear, Hospital, Gray's Inn-road, W.C.—Hon. Assts. for Out-patient Dept.

Charing Cross Hospital, Strand, W.C.—Surg. Reg. £150. Also Obstet. Reg. £100.

Children's Hospital, Hampstead, N.W.—Res. M.O. £100.

City of London Maternity Hospital, City-road, E.C.—Asst. Res. M.O. At rate of £80.

Doncaster Royal Infirmary.—Sen. Cas. H.S. At rate of £175.

Dudley, Guest Hospital.—Hon. Surgeon.

East Ham Memorial Hospital, Shrewsbury-road, E.—H.P. and H.S. and Cas. O. At rate of £150 and £120 respectively.

Edinburgh, Royal College of Physicians.—Dr. Jessie Macgregor Prize in Medical Science. £70.

Elizabeth Garrett Anderson Hospital, Euston-road.—Obstet. Asst. £50.

Exeter, Royal Devon and Exeter Hospital.—Cas. O. and H.S. to Spec. Depts. At rate of £150.

Great Yarmouth General Hospital.—Sen. and Jun. H.S.'s. At rate of £150 and £140 respectively.

Hampstead General and N.W. London Hospital, Haverstock-hill, N.W.—Cas. M.O. for Out-patient Dept. At rate of £100

Harrogate Infirmary.—Jun. H.S. £140.

Hull Royal Infirmary.—Hon. Surgeon. Also Hon. Asst. Surg.

Leicester Royal Infirmary.—H.S. and H.P.'s. Each at rate of £125.

Liverpool City.—Asst. Tuberculosis O. £500. Also Res. M.O.'s for Walton and Alder Hey Hospitals Each £200.

London Lock Hospital, 91, Dean-street, W.—Surg. Reg. £100.

London Lock Hospital, Harrow-road, W.—Surg. Reg. £100.

London School of Economics, Houghton-street, Aldwych, W.C.—6 Scholarships. Each £200.

Manchester Babies Hospital, Burnage-lane, Levenshulme.—Jun. Res. M.O. At rate of £50.

Manchester, Hulme Dispensary, Dale-street.—Res. M.O. £300.

Manchester, Northern Hospital, Park Place, Cheetham Hill-road. Jun. H.S. £100.

Manchester, Royal Children's Hospital, Pendlebury.—Res. M.O. At rate of £125.

Manchester, Royal Children's Hospital, Gartside-street.—Two Asst. M.O.'s. Each at rate of £150.

Manchester and Salford, Hospital for Skin Diseases.—H.S. At rate of £100.

Miller General Hospital, Greenwich-road, S.E.—Res. Surg. O. and Reg. £250. Also H.P. £100.

National Hospital for Diseases of the Heart, Westmoreland-street, Marylebone, W.—Res. M.O. Also Out-patient O. At rate of £150 and £125 respectively.

Newcastle-upon-Tyne, Hospital for Sick Children.—H.P. Also Sen. and Jun. H.S.'s. Each at rate of £100.

North Middlesex County Hospital, Edmonton.—Jun. Res. Asst. M.O. £250.

Northwood, Middx., Mount Vernon Hospital.—H.S. £150.

Nottingham City Mental Hospital.—Second Asst. M.O. £400.

Nottingham General Dispensary, Broad-street.—Res. Surgeon. £250.

Plymouth, South Devon and East Cornwall Hospital.—H.S. At rate of £100.

Prince of Wales's General Hospital, Tottenham, N.—Sen. and Jun. H.P.'s and H.S.s. At rate of £120 and £90 respectively.

Queen Charlotte's Maternity Hospital, Marylebone-road, N.W.—Asst. Res. M.O. Also District Res. M.O. Each at rate of £80.

Queen's Hospital for Children, Hackney-road, E.—H.P. and Cas. O. Each at rate of £100

Richmond, Surrey, Royal Hospital.—Hon. Surg. Also Jun. H.S. At rate of £100.

Rotherham Hospital.—H.P. £180.

Royal Free Hospital, Gray's Inn-road, W.C.—Asst. Surgeon to Ear, Nose and Throat Dept.

Royal National Orthopædic Hospital, 234, Gt. Portland-street, W. H.S. At rate of £150. Hon. Dental Surgeon. Also 2 H.S.'s for Country Branch, Brockley Hill, Stanmore. Each at rate of £150.

Royal Waterloo Hospital for Children and Women, Waterloo-road, S.E.—Hon. Med. Reg.

Samaritan Free Hospital for Women, Marylebone-road, N.W.—H.S. At rate of £100.

(*Continued at foot of next page.*)

The Eugenics Society: the Galton Lecture.

The annual dinner of the Eugenics Society was held at the Rembrandt Hotel, London, on Feb. 16th, the President, Sir Bernard Mallet, being in the chair.

After the dinner the Galton lecture was delivered by Mr. E. J. Lidbetter on the "Social Problem Group"; it was a report upon a detailed and painstaking investigation into the incidence of social inadequacy in an East London district. The main message was the necessity to recognise the existence of a definite race, usually of chronic paupers, breeding-in through successive generations, becoming parasitic upon the community, and passing their lives at the public expense in institutions, asylums, infirmaries, and jails. In illustration of his statements, the lecturer summarised a series of pedigrees which, he said, were in no sense selected but were, on the contrary, representative of hundreds which had been put together; and by the help of diagrams he proved the tendency of these unfortunates to in-breed with great fertility and to produce offspring from generation to generation of insane, mentally and physically defective, and incompetent persons. He pointed to the fact that while the definitely defective, who formed the smaller proportion, could be dealt with in various manners, the higher grade defective, being a freer agent, hampered the whole administrative machinery of society, lowering the general standard of life and of employable labour, and spreading venereal disease. The conclusions reached by the Eugenics Society were, he said, being confirmed by a Departmental Committee from the statistical angle, and the existence of a "Social Problem Group" was being definitely proved. But further and more extensive investigations would have to be carried out before any general remedial measures could be suggested.

A vote of thanks to the lecturer was proposed by the Rev. J. C. Pringle, secretary of the Charity Organisation Society, and seconded by Lord Riddell, who hoped that Mr. Lidbetter would be converted to the view that in voluntary sterilisation a partial remedy, at least, would be found for some of the terrible circumstances revealed. A vote of thanks having been enthusiastically given, Mr. Lidbetter disclaimed any definite opposition to the proposed legislation in respect of sterilisation, but pointed out that in the pedigrees which he had detailed there occurred among the offspring of the "Social Problem Group" a certain proportion of apparently normal persons whose children often reverted to defective types.

The dinner was very amply attended.

Manchester Royal Infirmary.

Weekly post-graduate lectures and demonstrations will be resumed at this hospital on Tuesday next at 4.15 P.M., and weekly demonstrations of clinical cases and methods in wards and special departments on Friday at the same hour. Particulars will be found in our Medical Diary each week.

An Old Patients Association.

Attached to Salford Royal Hospital is an old patients' association, numbering some 1500 members. The fundamental obligation is to subscribe half a crown annually for the maintenance of "grateful remembrance beds." In the last five years three such beds have been opened, and it is expected that a fourth will be produced in the coming summer.

Dr. Jessie Macgregor Prize, Edinburgh.

An award of this prize will be made in July for original work in medicine. Such work must not have been published more than three years previously. The prize is of the value of £70 and applicants must be medical women who have studied at Edinburgh for at least a year and are graduates of the University or hold the triple qualification. The successful applicant is expected to deliver a lecture on her work. Applications marked "Dr. Jessie Macgregor Prize in Medical Science" must reach the convener of trustees, Royal College of Physicians of Edinburgh, not later than April 30th.

Appointments

Overend, H. F., L.R.C.P. Lond., M.R.C.S., has been appointed Certifying Surgeon under the Factory and Workshop Acts for Blackpool.

Tivy, C. B. F., M.Ch. R.U.I., a Medical Referee under the Workmen's Compensation Act (Ophthalmic cases) for Circuit 59 and certain districts in Circuit 57.

Whitelaw, A. D., M.D., Ch.B. Camb., Medical Officer of Health, East Herts Combined District.

West Kent General Hospital: Oliver C. Pye, junr., M.B., B.Chir. Camb., Hon. Asst. Physician; Johnston, D. M., M.D. Durh., Hon. M.O. in charge of Artificial Sunlight Dept.

Medical Diary

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICIN [illegible]
MONDAY, Feb. 22nd.—8 P.M., [illegible]
munication: Mr. Harve [illegible]
Proliferation of Bone in [illegible]
Paper: Dr. H. H. Stones: The Surgical Treatment o
Pyorrhœa Alveolaris.
TUESDAY.—5 P.M., MEDICINE. Cinematograph demonstration. Dr. Ladislas Schmidt (Pistany): Respirator
Movements in Disease. Subject introduced by Si
Charlton Briscoe.
WEDNESDAY.—5 P [illegible] ussion
Milk Fever [illegible] Cow
and Similar [illegible] d Ma
Opener: Pr [illegible] Pro
E. C. Dodds, Mr. W. L. Little, Prof. H. Dryerre, M
O. Stinson, and Dr. R. Robison.
THU [illegible]
FRI [illegible]
attend.

MEDICAL SOCIETY OF LONDON, 11, Chandos-stre
Cavendish-square, W.
MONDAY, Feb. 22nd.—8.30 P.M., Discussion on Asth
and Allied Conditions. To be introduced by Dr. Geo
H. Oriel and Dr. George W. Bray.

HUNTERIAN SOCIETY.
THURSDAY, Feb. 25th.—9 P.M. (at the Apothecaries H
Water-lane, E.C.), Dr. J. B. Christopherson: T
Ætiology of Chronic Bronchitis. (Hunterian Oratio

MEDICO-LEGAL SOCIETY.
[illegible] 0 P.M. (at 11, Chandos-str
[illegible] Dr. Gerald Slot: Sud
[illegible] by a discussion.

MEDICAL SOCIETY FOR THE STUDY OF VENERE
DISEASES, 11, Chandos-street, W.
FRIDAY, Feb. 26th.—8.30 P.M., Dr. Anwyl Davies:
Reasons of the Failure of Venereal Disease Clinic
Attract Women Patients. A Discussion will foll

LECTURES, ADDRESSES, DEMONSTRATIONS, &c

ROYAL COLLEGE OF PHYSICIANS, Pall Mall East, S
TUESDAY, Feb. 23rd.—5 P.M., Prof. Cyril Okell:
Rôle of the Hæmolytic Streptococci in Infec
Disease. (Second Milroy lecture.)
THURSDAY.—5 P.M. (Last Milroy lecture.)

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Linc
Inn Fields, W.C.
MONDAY, Feb. 22nd.—5 P.M., Dr. A. J. E. Cave: Mor
logical and Functional Anatomy of the Human Cer
Spine. (Arris & Gale lecture.)

FELLOWSHIP OF MEDICINE AND POST-GRADU
MEDICAL ASSOCIATION, 1, Wimpole-street, W.
MONDAY, Feb. 22nd, to SATURDAY, Feb. 27th.—ME
SOCIETY OF LONDON, 11, Chandos-street, Caven
square. Fri., at 4 P.M., Dr. R. D. Lawrence:
Difficulties in Insulin Treatment in General Pra
[illegible] DISEASE
Open only t [illegible] 2.30
THE SKIN, [illegible] —CHE
demonstratic [illegible] Fr
HOSPITAL FC [illegible] at 3
2 P.M., Lect [illegible] NER
by operatio [illegible] ., lec
DISEASES, W [illegible]
and clinical demonstration in Neurology.—BET
ROYAL HOSPITAL, Monks Orchard, Eden Park.
and Fri., at 11 A.M., [illegible] in Psycholo
Medicine.—ROYAL ALB [illegible]
Week-end course in Cli [illegible]
day.—Further particul [illegible]

NATIONAL HOSPITAL, Queen-square, W.C.
MONDAY, Feb. 22nd.—2 P.M., Dr. Riddoch: Out-pa
Clinic. 3.30 P.M., Dr. Kinnier Wilson: Epilepsy
TUESDAY.—2 P.M., Dr. Walshe: Out-patient C
3.30 P.M., Dr. Martin: Diseases of the Vert
Column with Nervous Symptoms.
WEDNESDAY.—2 P.M., Dr. Martin: Out-patient C
THURSDAY.—2 P.M., Dr. Kinnier Wilson: Out-pa
Clinic. 3.30 P.M., Dr. Gordon Holmes: Sympto
Cerebellar Disease.
FRIDAY.—2 P.M., Dr. Adie: Out-patient Clinic. 3.30
Sir Percy Sargent: Surgery of the Sympat
System.

WEST LONDON POST-GRADUATE COLLEGE, Ham
smith, W.
MONDAY, Feb. 22nd.—10 A.M., Gynæcological W
Genito-urinary Operations, Skin Department. 11
Surgical Wards. 2 P.M., Surgical Wards, Me
Surgical, Eye, and Gynæco [illegible]
TUESDAY.—9.30 A.M., Operations,
Dental Department. 11 A.M., [illegible]

Demonstration in Surgery. 2 P.M., Operations, Medical Surgical, Throat Out patients.

WEDNESDAY.—10 A.M., Medical Wards, Children's Medical Out-patients. 2 P.M., Gynæcological Operations, Medical, Surgical, and Eye-Out-patients. 4.45 P.M., Venereal Diseases.

[illegible] Out-patients. 11.30 A.M., [illegible] Operations, Medical, [illegible] Out-patients.

FRID[illegible] Skin Out-patients, Dental Department. 12 noon, Medical Lecture. 2 P.M., Medical, Surgical, and Throat Out-patients Operations.

ATURDAY.—9 A.M., Throat Operations. 10 A.M., Medical Wards, Children's Medical Out-patients, Surgical Out-patients.

S HOSPITAL, London Bridge, S.E.

IONDAY, Feb. 22nd.—5 P.M., Dr. A. E. Barclay: The Use of X Rays in Physiological Investigation.

AL NORTHERN HOSPITAL, Holloway-road, N.

UESDAY, Feb. 23rd.—3.15 P.M., Dr. C. C. Beatty: Misleading Symptoms.

ERSITY COLLEGE HOSPITAL MEDICAL SCHOOL, versity-street, W.C.

UESDAY, Feb. 23rd.—5.15 P.M., Dr. Dorothy Russell: Intracranial Tumours.

RING CROSS HOSPITAL MEDICAL SCHOOL.

UNDAY, Feb. 21st.—10.45 A.M., Mr. W. H. McMullen: Headaches Associated with Ocular Defects. 11.45 A.M., Mr. Norman C. Lake: The Diagnosis of Gastric and Duodenal Ulcer.

'S COLLEGE HOSPITAL MEDICAL SCHOOL, mark-hill, S.E.

HURSDAY, Feb. 25th.—9 P.M., Dr. M. Critchley: Precocious and Premature Old Age.

H-WEST LONDON POST-GRADUATE ASSOCIAN, St. James' Hospital, Ouseley-road, Balham.

EDNESDAY, Feb. 24th.—4 P.M., Mr. V. Z. Cope: Demonstration of Surgical Cases.

RAL LONDON THROAT, NOSE, AND EAR HOSAL, Gray's Inn-road, W.C.

RIDAY, Feb. 26th.—4 P.M., Mr. N. Asherson: Complications of Tonsillectomy.

ITAL FOR EPILEPSY AND PARALYSIS, Maida e, W.

HURSDAY, Feb. 25th.—3 P.M., Dr. Wilfred Harris: Demonstration of Cerebral Tumours.

PSTEAD GENERAL AND NORTH-WEST LONDON SPITAL.

EDNESDAY, Feb. 24th.—4 P.M., Mr. W. H. Ogilvie: Common Injuries of the Wrist and their Treatment.

OF LONDON MATERNITY HOSPITAL, City-road,

HURSDAY, Feb. 25th.—5.30 P.M., Mr. R. Christie-Brown: General Principles in the Treatment of Hæmorrhage as applied to Obstetrics.

ETER'S HOSPITAL, Henrietta-street, W.C.

EDNESDAY, Feb. 24th.—3 P.M., Mr. J. A. Andrews: Enlarged Prostate

Vacancies

For further information refer to the advertisement columns.

Aberdeen Royal Mental Hospital.—Jun. Asst. Phys. £300.

Antrim Mental Hospital, N. Ireland.—Res. Med. Supt. £800.

Assam.—M.O. for Tea Estates Rs.1500 a month.

Ayr County Hospital.—H.S. £150.

Birmingham, General Hospital.—Res. Surg. Reg. £100–£120–£140.

Birmingham, Maternity and Child Welfare Dept.—Res. M.O. £250.

Birmingham, Queen's Hospital.—Ophth. H.S. and Res. Anæsthetist. £70–£100.

Blackburn. Calderstones (Certified Institution for Mental Defectives) Whalley.—Asst. M.O. £500.

Bootle General Hospital, Nr. Liverpool.—Cas. O. and H.S.'s. Each at rate of £150.

Brighton Education Committee.—Asst. School M.O. and Asst. to the M.O.H. £500.

Bristol Eye Hospital.—Hon. Asst. Surgeon.

British Medical Association.—Asst. Med. Secy. £800.

Cambridge, Addenbrooke's Hospital.—Three H.S.'s to Special Depts. Each at rate of £130.

[illegible]—E. G. Fearnside Scholarship for Clinical

n-road, S.W.—H.S. At rate of £100.

firmary.—H.P. 2nd H.S. and H.S. to £155.

Nose, & Ear, Hospital, Gray's Inn-road, W.C.—Hon. Assts. for Out-patient Dept.

Charing Cross Hospital, Strand, W.C.—Surg. Reg. £150. Also Obstet. Reg. £100.

Children's Hospital, Hampstead, N.W.—Res. M.O. £100.

City of London Maternity Hospital, City-road, E.C.—Asst. Res. M.O. At rate of £80.

Doncaster Royal Infirmary.—Sen. Cas. H.S. At rate of £175.

Dudley, Guest Hospital.—Hon. Surgeon.

East Ham Memorial Hospital, Shrewsbury-road, E.—H.P. and H.S. and Cas. O. At rate of £150 and £120 respectively.

Edinburgh, Royal College of Physicians.—Dr. Jessie Macgregor Prize in Medical Science. £70.

Elizabeth Garrett Anderson Hospital, Euston-road.—Obstet. Asst. £50.

Exeter, Royal Devon and Exeter Hospital.—Cas. O. and H.S. to Spec. Depts. At rate of £150.

Great Yarmouth General Hospital.—Sen. and Jun. H.S.'s. At rate of £150 and £140 respectively.

Hampstead General and N.W. London Hospital, Haverstock-hill, N.W.—Cas. M.O. for Out-patient Dept. At rate of £100

Harrogate Infirmary.—Jun. H.S. £140.

Hull Royal Infirmary.—Hon. Surgeon. Also Hon. Asst. Surg.

Leicester Royal Infirmary.—H.S. and H.P.'s. Each at rate of £125.

Liverpool City.—Asst. Tuberculosis O. £500. Also Res. M.O.'s for Walton and Alder Hey Hospitals. Each £200.

London Lock Hospital, 91, Dean-street, W.—Surg. Reg. £100.

London Lock Hospital, Harrow-road, W.—Surg. Reg. £100.

London School of Economics, Houghton-street, Aldwych, W.C.—6 Scholarships. Each £200.

NOTES, COMMENTS, AND ABSTRACTS

GENERALISED SCLERODERMA IN CHILDREN.

Dr. E. Lawrence Oliver,[1] of Boston, has lately described three cases of this rare condition with a review of others. The rarity of generalised scleroderma in children is illustrated, he says, by the fact that of 508 cases collected by Lewis and Heller in 1895, only 10 were met with under 15 years of age, while of 103 cases of scleroderma, of which 48 were generalised, reported by O'Leary and Nomland in 1930, none occurred in children. The principal cause alleged to account for the condition is hypofunction, hyperfunction, or dysfunction of one or more of the ductless glands, especially the thyroid or suprarenals. It is noteworthy in this connexion that among 111 cases of dermatoses associated with exophthalmic goitre Hyde and McEwen found five examples of scleroderma. As regards the immediate possible causes of generalised scleroderma almost every common infection has been incriminated, especially rheumatic fever, the other infections regarded as responsible for some cases being influenza, syphilis, diphtheria, erysipelas, and tonsillitis. Oliver, however, thinks it most probable that these infections act merely as the spark that starts the conflagration and that other factors must be present to supply the inflammable material. He agrees with Hoffmann and Michael in the belief that an unstable vegetative constitution is the fundamental cause. The prognosis of generalised scleroderma in children is evidently much brighter than in adults. for most of the recorded cases have recovered. Of Oliver's three cases complete recovery took place in two and considerable improvement in the third. While it is doubtful if there is any specific treatment for the condition, a trial should be made of thyroid extract or extracts of other endocrine glands. The patients should be guarded against the cold to which they are supersensitive, and in most cases they will derive benefit from massage, which aids the circulation and prevents loss of mobility.

LIVING IN TWO WORLDS.

In "The Great Amphibium,"[2] Dr. Joseph Needham prints four lectures on the position of religion in a world dominated by science. "Thus is man," said Sir Thomas Browne, "that great and true Amphibium whose nature is disposed to live, not only like other creatures in diverse elements, but in divided and distinguished worlds." Dr. Needham agrees, and he sees a clear division and very little prospect of reconciliation between man's attempts to apprehend the world's ultimate mystery, which we call religion, and his efforts to investigate the world's apparent mechanism, which we call science. Valuing both as integral parts of human nature, he is content to leave them at variance and in opposition to one another. We commend his arguments to anyone who is interested in such questions, but we cannot help feeling that he has misled himself by attributing to science and the scientific outlook qualities which are flatly contrary to experience and represent a crude and elementary view of the situation, which does not actually exist. He says, for instance, that the incomprehensibility of God is the basis of religious mysticism, while the comprehensibility of the universe is the corner-stone of science; in actua experience, the religious and scientific interests of a human being are based on just the same ideal—th hope that by paying attention to the matter we ma *some day understand something* which at presen seems mysterious. He lives all the time in the sam world, and we judge that Dr. Needham has constructe an entirely unreal abstraction in putting together scientific atmosphere in which ethics and reveren have no place.

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[1] Arch. Dermat. and Syphilol., January, 1932, p. 72.

[2] Student Christian Movement, 1931, pp. 180, 6*s*.

HIGGINSON'S SYRINGE.

EVERYONE knows Higginson's syringe, but few a aware that its *hero eponymus* was a surgeon on t staff of the Liverpool Southern Hospital in t 'seventies, with bushy eyebrows, a long white bea and a strong resemblance to Charles Darwin. T was told to the Section of the History of Medic of the Royal Society of Medicine on Feb. 3rd Dr. Dan McKenzie, who also showed a picture o bulbous rubber enema syringe, made and used savage natives of Brazil, where rubber grows w He observed that the ancient Egyptians and oth in antiquity used enemata, administered by a syrin a funnel, or a long cylinder, the patients in the pr or knee-elbow positions, as in pictures exhibit A social fashion of giving enemata arose in the co of Louis XIV., which explained the references Molière (1660), but it did not spread extensivel England. Brass enema pumps with india-ru tubes were shown, permitting administration in sitting or supine positions, and allowing administration. The advance of rubber ma facture made Dr. Higginson's proposal practica It may be added that the frequent giving of enem on board ships—so often referred to by Smollett a 1740—must have been especially difficult, as th then were. Incidentally, as is well known, it was surgeon Syme who first devised the method, introduced to industry by Mackintosh, of w proofing cloth with a solution of india-rubber.

A WARNING.

Mr. Hamilton Kirk, M.R.C.V.S., writes 658, Finchley-road, London, N.W. 11.

"I wish to give timely warning to all practitio not to purchase a second-hand Philips Me Portable X ray apparatus bearing the maker's nu 4760, or (more significant still) no number at This set, in a leather case and with an auto-t former No. 138284, was stolen from my moto and I have offered £15 reward to anyone who help me to recover it."

(*Continued from previous page.*)

St. John's Hospital for Diseases of the Skin, 49, Leicester-square, W.C.—Out- and In-patients Registrars. Each £50.
Sheffield, Jessop Hospital for Women.—H.S. At rate of £100.
South Shields, Ingham Infirmary.—Sen. and Jun. H.S.'s. £200 and £150 respectively.
Stoke-on-Trent, North Staffordshire Royal Infirmary.—Orthopædic H.S. £150.
Tancred's Studentships.—Three Students. Each £100.
Ventnor, Isle of Wight, Royal National Hospital for Consumption. Sen. Asst. Res. M.O. £400.
West Riding of Yorkshire County Council.—School Med. Inspectors. £500.
Willesden General Hospital, Harlesden-road, N.W.—Hon. 2nd Radiologist.
Windsor, King Edward VII. Hospital.—Res. M.O. £200.

Births, Marriages, and Death

BIRTHS.

BOLT.—On Feb. 10th, at Welbeck-street, W., the wife of Ri Frank Bolt, M.R.C.S., L.R.C.P., of Great Russell-s W.C., of twin sons.

SCHOLEFIELD.—On Feb. 10th, at a nursing home, Black the wife of Bernard G. Scholefield, F.R.C.S., of a dau

MARRIAGES.

TYLECOTE—PHYTHIAN.—*On Feb. 6th, at Hitchin,* Edward Tylecote, M.D., F.R.C.P. Lond., of Manch to Mabel Phythian, Ph.D., late Warden of Elvi Settlement, Kent, and younger daughter of J. Ernes the late Ada P. Phythian.

DEATHS.

DAY.—On Feb. 8th, at Goring Lodge, Links-road, E Arthur Percival Day, B.A., M.R.C.S., L.R.C.P., age

SPENCER.—On Feb. 8th, at Queen Alexandra Military Hos Lieut.-Colonel Charles George Spencer, F.R.C.S., Royal Army Medical Corps, aged 63 years.

N.B.—A fee of 7s. 6d. is charged for the insertion of Noti Births, Marriages, and Deaths.

ADDRESSES AND ORIGINAL ARTICLES

SOME FACTORS IN THE CAUSATION OF HYDRONEPHROSIS.*

BY J. P. HOSFORD, M.S LOND., F.R.C.S. ENG.,

FIRST ASSISTANT IN THE SURGICAL PROFESSORIAL UNIT, ST. BARTHOLOMEW'S HOSPITAL.

THE causes of hydronephrosis may be divided into congenital and acquired. The term *congenital hydronephrosis* at once raises a difficulty in nomenclature, because there is a type commonly called congenital in which the dilatation affects mainly the pelvis of the kidney. In that the dilatation is probably not present at birth it is not really congenital, although the factors (whatever they be) which cause it may be congenital. It is best to confine the term congenital to those types of hydronephrosis which are present in the new-born or are discovered soon after birth. It is found that they fall into two main groups :—

(1) Where there is some discoverable mechanical cause obstructing either the ureter or urethra.

(2) Cases of megalo-ureter combined with hydronephrosis in which there is no discoverable obstruction.

In the first group the ureter may show a definite stricture, narrowing, or fold, or it may present as an impervious cord. In quite a number of those cases showing distension of the bladder, as well as distension of the ureters and kidneys, some congenital mechanical obstruction [1] can be found in the posterior urethra. The commonest is a valve,[2,3] so arranged that it obstructs the downward passage of urine, but does not prevent the upward passage of a bougie.

In the second group, where no obstruction can be found, the ureteric orifices and bladder sometimes share in the dilatation, though in others the kidney and ureter of one side are alone affected. The cause of the dilatation is unknown, but it has been suggested by some authorities that the explanation may be an embryological one. It has been shown by Gerard [4] that the ureters in fœtal life up to the third or fourth month are of large calibre, as compared with the size of the kidney and the rest of the body. Deficient development of the musculature of the ureter may be the cause.

This musculature does not begin to develop until the third month—it begins at the lower end of the ureter and gradually spreads up to the renal pelvis. Eisenstaedt [4] says that an imperfect development, a true hypoplasia of the muscle-fibres must be seriously considered as a possible cause. This possibility, in addition to the persistence of the wide calibre of the ureters as seen in early fœtal life, may explain the condition of congenital megalo-ureters and dilatation of the renal pelvis.

I wish to divide the causes of *acquired hydronephrosis* into two groups also :—

(1) When there is a demonstrable macroscopic obstruction.

(2) When there is no such obstruction.

In the first group the obstruction may be due to a variety of lesions, amongst which may be mentioned calculus, neoplasms or tuberculous inflammation obstructing the ureter, ureteral strictures, and ureteral kinks. In connexion with the last of these I will refer later to aberrant vessels and abnormal mobility of the kidney. I do not propose to deal with the question of urethral or bladder obstructions in the cause of hydronephrosis.

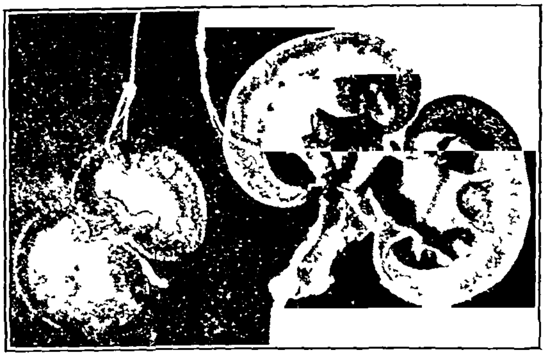
The group of cases where there is no demonstrable macroscopic obstruction is of much greater interest, and I will refer to it at some length later on.

Effect of Obstruction of Ureter.

I now wish to consider the effect on the kidney of obstructing the ureter. Information on this subject can be derived from animal experiments and from human pathological material and from those uncommon occasions when the ureter in man, or more commonly woman, is tied intentionally, or by accident, in the course of some surgical operation.

It is often taught and it is still stated in many text-books that a ligature tied tightly around a ureter so as completely to obstruct it does not cause a hydronephrosis, but brings about an anuria and primary atrophy of the kidney. Now this is contrary to nearly all experimental evidence. It has repeatedly been shown that complete obstruction to a ureter in different animals causes a hydronephrosis. Working with rabbits I have found that in every case where the ureter has been completely obstructed, whether it be at the upper or lower end or in its middle, a hydronephrosis has developed, and in no instance has there been a primary atrophy. There can have been no question about the completeness of the obstruction, because the ureter was doubly ligatured and divided between. The only way in which I have produced a primary atrophy experimentally when the ureter has been obstructed, is by performing a simultaneous ligature of the renal artery.

FIG. 1.



Hydronephrosis of left kidney of rabbit produced by complete ligature of ureter. Animal killed after 14 days.

As the hydronephrosis increases in size there is a gradual destruction or atrophy of the renal parenchyma, and eventually the condition of hydronephrotic atrophy results in which all the renal secreting tissue is destroyed, and a thin-walled sac of watery fluid remains. The larger the animal the longer does it take for complete hydronephrotic atrophy to become established ; the time for this to happen in man is unknown, but in the rat it is about four months, in the rabbit ten months, and in the dog 18 months or more. In experimental work a primary atrophy has occasionally been produced, but only in cases with an associated pyelonephritis. It is well known that a hydronephrosis of considerable size can form without causing any symptoms, and it is probable that when a ureter is ligatured in man a hydronephrosis follows, and goes on to the stage of hydronephrotic atrophy without causing symptoms. There is little clinical material from which to gain information on this point, but A. E. Belt,[5] in reviewing 64 cases of complete ureteral ligature collected from the literature, found that in 38 there was definite evidence of renal disturbance, either immediate or at some later time. Out of 17 of these cases, in which a later examination was obtained, it was found that 14 showed a definite hydronephrosis.

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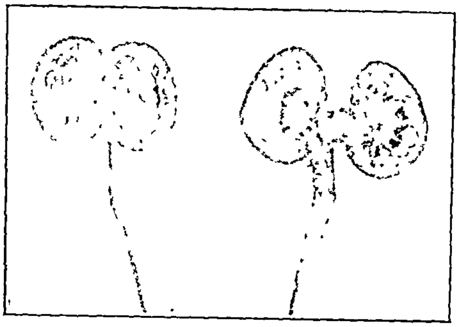
* Hunterian lecture delivered before the Royal College of Surgeons of England on Feb. 1st.

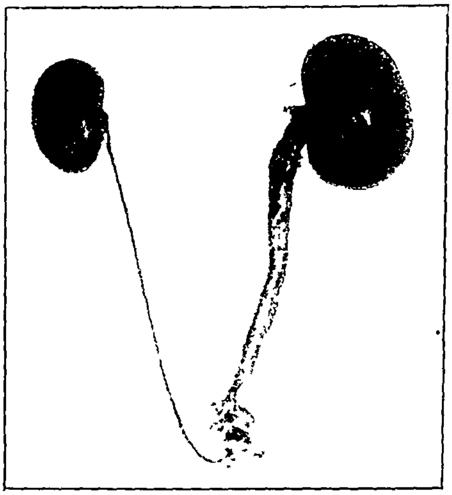
FIG. 2.



Hydronephrosis of left kidney of rabbit produced by incomplete ligature of ureter. Animal killed after 11 days.

An incomplete or partial obstruction to a ureter, as is well known, produces a hydronephrosis. The rate of formation and eventual size of the hydronephrosis varies, of course, according to the degree of obstruction. The types of hydronephrosis which are found experimentally with complete and partial ureteral obstruction are the same—they differ only in degree. The rate of formation is more rapid with a complete obstruction, though with an incomplete obstruction the hydronephrosis will progress to a much greater size, but eventually in most cases there will be a total atrophy of the renal parenchyma. Another question which is asked is whether there is any difference in the hydronephrosis produced by a high or low ureteral ligature. Answering from experimental work in animals it can be said that the type of hydronephrosis as regards proportional dilatation of pelvis and calices is the same, but the size of the hydronephrosis is usually a little different; with a low ureteral ligature the rate of formation is somewhat slower than with a high ligature. This has been my experience also.

FIG. 3.

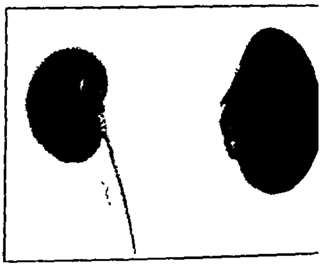


Hydronephrosis and hydroureter of left kidney of rabbit produced by complete ligature of ureter at lower end. Animal killed after 14 days.

Functional Obstruction.

So far I have referred to anatomical obstructions to the ureter. Can there be such a thing as physiological or functional obstruction causing hydronephrosis? The urine secreted by the kidney is conveyed along by a wave of peristalsis. This wave starts in the major calices near the tips of the renal papillæ and sweeps over the pelvis; it slows up at the pelvi-ureteric junction, and then becomes more marked as it passes along the ureter. Stimulatic
by pinching only sets up a wave of contraction wh
the stimulus is applied to the area near the tips
the renal papillæ—other areas are refractory. Stim
lation of the ureter causes much stronger contractio
than can be obtained in the pelvis. Now it mig
be thought that if this peristaltic wave in the calic
pelvis, and ureter were interrupted, there might be a paralytic obstruction to the outflow of urine such as is known to occur in the intestine in paralytic conditions. Experiments were done in an attempt to produce such an obstruction. The ureter in a rabbit was exposed transperitoneally, the periton
being divided over its whole length. It was then li
free from the posterior abdominal wall, the l
areolar tissue being stripped from it so that
ureter remained attached at only its two ends.
apparently in no way interfered with the no
peristalsis, because after 21 days the kidney sho
not even the earliest degree of hydronephrosis.

FIG. 4.



Hydronephrosis of left kidney of ra
produced by complete ligature of ur
at upper end. Animal killed afte
days.

More drastic experiments were carried out.
ureter was exposed as before and lifted from its
By blunt dissection with a forceps the entire musc
coat of the ureter was stripped off for a distanc
2·5 cm., so that only the mucous membrane remai
It certainly looked at the time of the operatio
though it would be impos
for urine to be conveyed a
this section of ureter, but
result in all cases except
was the same—there was
scarring around the are
ureter which had been stri
but the ureter above this p
as well as the kidney, app
perfectly normal. In one
where the stripping had
done in the region of the
ureteric junction the m
membrane had apparently
perforated at the time of o
tion, and there had occur
urinary leak into the surr
ing tissues, with the
that a localised sac conta
urine, with a thick adv
tious wall, had formed
communicated with the
end of the ureter, and so
the kidney; the ureter
this point was fibrosed
quite impervious, so that
kidney was hydroneph
Watson Beach,[6] in an in
gation into atony of the u
as a cause of hydronephrosis, removed
2 cm. of the ureter in a rabbit and rep
it by a glass cannula. He found some dilat
of the ureter above the cannula, and a

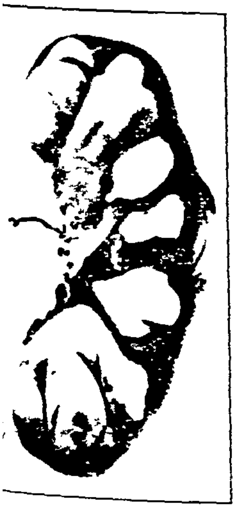
degree of hydronephrosis. A rabbit's ureter is very small, and to insert a cannula into it in such a way as to cause no fibrosis or mechanical obstruction cannot be at all easy. It is difficult to assess the exact value of his experiments as demonstrating a functional obstruction, because there is such a considerable likelihood of producing some fibrosis and mechanical block where the cannula is inserted, and also because the experiments of stripping off all the muscular coats of the ureter give results opposed to Beach's.

Types of Hydronephrosis.

Before proceeding further with the causes it may be well to mention the different types of hydronephrosis. The following will be discussed: (1) renal type; (2) pelvi-renal type; (3) pelvic type.

It is not always easy to separate these three sharply from one another, but in the *renal type*, which is usually due to a calculus, the kidney is considerably enlarged owing to a dilatation of the calices and destruction of the renal parenchyma, the pelvis being scarcely increased in size at all, or only sufficiently to contain the calculus or calculi.

FIG. 5.



Renal type of hydronephrosis with calculus in pelvis, removed at operation.

The *pelvi-renal type* is usually due to some definite visible obstruction to the ureter below the pelvi-ureteric junction—it may be within the lumen of the ureter, in its wall, or from external pressure.

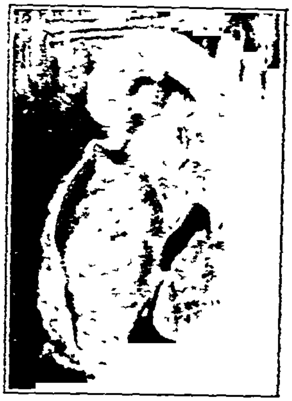
In the *pelvic type*, although the whole kidney shares in the dilatation, the pelvis is mainly affected. It is often spoken of as the congenital type; this is probably an incorrect term, because it is unlikely that it is present at birth, although the factors which cause it may be some congenital defects or maldevelopments. Idiopathic is a better term, although it takes us no nearer the cause. The origin of this type of hydronephrosis is usually obscure. Many papers have been written on this subject.[7, 8] Most of them are devoted mainly to explaining why the obstruction, which is at first not evident, really exists; and, in an endeavour to understand the cause, too little attention seems to be paid to the really rather remarkable fact of the disproportionate dilatation of the pelvis as compared with the remainder of the kidney.

Causes of "Idiopathic" Hydronephrosis.

I think it well to examine for a few minutes some of the causes which have been or are put forward to explain the occurrence of this so-called idiopathic type of hydronephrosis.

(1) *Stricture of the ureter.*—There is a great difference of opinion amongst urologists as to the frequency of occurrence of ureteral stricture. In 1925 Hunner was quoted as having seen over 2000 cases, while other urologists of wide experience meet with them but seldom. In many of the cases of idiopathic hydronephrosis a stricture is described as being present at the pelvi-ureteric junction, and on examining specimens of this condition a narrowing certainly is sometimes found. It is, however, uncommon to find that during life a full-sized ureteric catheter cannot easily be passed right up into the renal pelvis, so that no very marked narrowing can be present. Hunner believes that focal sepsis is much the commonest cause of ureteral strictures. Winsbury White, who has done much work on this subject, believes that the earliest cases show narrowing of the ureter from chronic inflammation, and that this appears to be the cause of the dilatation. But why, one asks, does the dilatation affect mainly the pelvis.

FIG. 6.



Pelvic type of hydronephrosis.

(2) *Abnormal mobility of the kidney* has frequently been blamed as a cause of hydronephrosis. It is suggested that the unusually low descent of the kidney causes a kinking of the ureter, but it is difficult to see why or over what it becomes kinked. Apart from aberrant vessels there are no structures commonly present which can be found post mortem, or at operation, which might cause such a kink. It is true that by pyelography, either by means of a ureteric catheter or by excretion methods, kinks can be demonstrated in patients who have attacks of renal pain; but frequently there is no associated hydronephrosis. Movable kidney most commonly causes symptoms in the fourth or fifth decade, while idiopathic hydronephrosis is usually seen before this. Many cases of movable kidney of long standing, although having attacks of pain, show no real evidence of hydronephrosis, although the symptoms may be relieved by nephropexy. This operation not uncommonly brings definite relief of the pain, but it is no proof that it is due to relieving a hydronephrosis by straightening out the ureter. Unless the kink is very sharp the ureter is a structure unlikely to be obstructed, because being a muscular tube it can straighten itself out somewhat in parts as waves of peristalsis pass along it. It is true that a sharp kink will cause a hydronephrosis by obstructing the ureter. I have shown this experimentally by kinking the ureter in a rabbit by means of a piece of silk which was attached to the muscles of the posterior abdominal wall above the kidney, and below was looped round the ureter about 1 cm. from the pelvi-ureteric junction. A well-marked hydronephrosis had formed in 28 days. The experiment was repeated, but this time the silk thread was attached above to the twelfth rib. In both cases there was a hydronephrosis and dilatation of the ureter on the proximal side of the distorting silk.

(3) *Aberrant renal vessels* are very frequently mentioned as a cause of hydronephrosis; but I think that probably the majority of urologists now agree that the pressure of the so-called aberrant vessel on the pelvi-ureteric region is usually a secondary affair; by that I mean that the artery does not press upon and kink the ureter or renal pelvis while they are of normal size, but that it is only when dilatation of the pelvis from some other cause has occurred

that this pressure and kinking effect occurs. Very frequently the artery which is called aberrant is really only the inferior branch of the renal artery entering the lowest part of the hilum of the kidney. The term aberrant should be reserved for those cases where there is an artery which, arising from either the main renal artery or the aorta, enters the lower pole of the kidney not by way of the hilum but actually through the renal parenchyma.

Winsbury White has described very clearly the mechanism by which the renal pelvis becomes involved by the inferior renal artery. He found in 9 out of 11 examples that the vessel implicating the ureter is a normal inferior branch of one of the main renal vessels. This branch runs down across the front of the pelvis to enter the lower part of the hilum, while the main renal artery lies above and behind the pelvis so that the latter lies between two arteries. As the pelvis enlarges for any reason it tends to bulge forwards between these two arteries owing to less resistance in front, and as it does so it hangs over and is constricted by the inferior artery lying in front. In a number of the cases of hydronephrosis associated with what at first appears to be an obstructing artery, it is found on closer examination that the constriction is not exactly at the point where the artery crosses the ureter; sometimes it is above, and rarely below.

(4) *Folds and valves.*—It is not an uncommon experience in cases of hydronephrosis of the pelvic type to find what is taken to be a valve or fold at the pelvi-ureteric junction. This valve is probably secondary to the dilatation, and not the primary obstruction causing it. As the pelvis gradually dilates in many cases of hydronephrosis it may be noticed that the dilatation occurs most markedly in the lowest part of the pelvis—this is like the urinary bladder enlarging in obstructive cases, for here, as in the pelvis, it is the lowest part or base which first enlarges most rapidly. This unequal enlargement has two effects: firstly, it causes the condition of high implantation of the ureter in the pelvis, because the relative distances from the ureter to the upper and lower borders of the hilum are altered. This high implantation is probably rarely, if ever, congenital. Secondly, it causes a valve-like opening, and this is exaggerated as the upper end of the ureter becomes adherent to the pelvis. This valve-like opening, once it is established, of course acts as an obstruction to the outflow of urine, and so causes the hydronephrosis to progress further; but it is almost certainly secondary to the dilatation and is neither a congenital malformation nor an initial cause of the hydronephrosis.

UNEXPLAINED CASES.

Although all the mechanisms mentioned above are possible causes of hydronephrosis, there are many cases in which it is difficult to say what primarily caused the condition. In some, several lesions which might account for it are found, while in others none at all can be discovered; but even in those cases where one or more lesions may be found, these are often secondary to the hydronephrosis and not the primary condition producing it. All these causes are mechanical and not functional. Often no visible obstruction is found. Indeed, as has already been mentioned, in the majority of cases a ureteric catheter can be passed right up into the renal pelvis, and in some the pelvi-ureteric junction has been described as being larger than usual, and although the hydronephrosis may reach a tremendous size it does not seem to be able to empty. In this connexion it may be *interesting* to recall the account of what is probabl the largest hydronephrosis ever recorded.

> In 1746 Dr. Glass [9] gave a most careful and convincin account of a post-mortem examination on a young woma of 23 who had had a large belly *for many* years. Tl circumference of the abdomen was six feet four inche When the abdomen was opened, he tapped the huge flu swelling and describes how he "evacuated a surprisi quantity of water, which was lightly tinged of a coff colour, limpid *as urine, and not in the least fœtid.* Tl water was carefully measured and found to be not above pint less than 30 gallons wine measure; which must weig according to common calculation, 240 lbs."

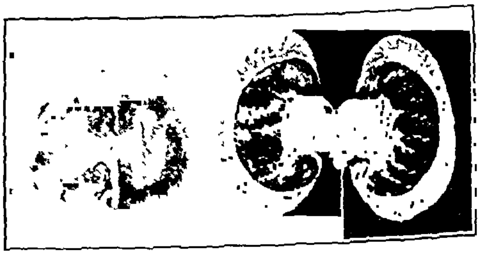
In describing the kidney and ureter Dr. Glass sai on the left inferior part was discovered the orifi of a duct, which opened obliquely into the cavi of the saccus, and would easily admit of a large goo quill. The oblique opening he mentions was probab the condition of oblique valve-like opening to whi I have already referred and which is secondary the dilatation of the kidney. We must therefore lo for some other cause for these hydronephroses.

Two questions have to be answered—what is t nature of the obstruction, is it mechanical functional? and secondly, though of equal importan why does the pelvis show a distension out of proporti to the remainder of the kidney? Can any help obtained from experimental work on animal Such work has already been briefly referred to, l it may be said at once that I can find no account any worker having produced what may be considered example of the pelvic type of hydronephrosis, inde the type of hydronephrosis is not referred to exc in a few papers, although there is a fairly abund literature on experimental hydronephrosis.[5 10–12]

EXPERIMENTS.

Working with rabbits I have been unable to prod a lesion of the kidney which could be considered be an example of a pelvic type of hydronephro

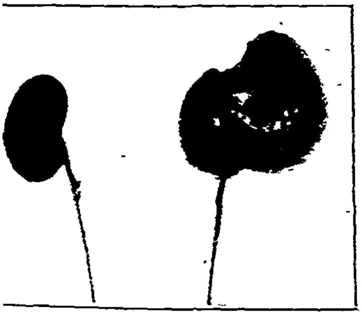
FIG. 7.



Hydronephrosis of left kidney of rabbit produced by comp ligature of ureter. Animal killed after 91 days.

although it is perfectly easy to produce a hy nephrosis in these animals, and I have done so i variety of ways. The ureter has been comple occluded by ligature and division in different anir for periods of one week, two weeks, six weeks, 13 weeks; the ureter has been partly occlu for two weeks in one animal and for seven we in three animals. This partial occlusion has b carried out in the majority of cases by tying a ligature around the ureter so as to obstruct it aln completely; an encircling fine silver band has been used to cause a partial obstruction. Both complete and partial ligatures have been app at the pelvi-ureteric junction and at the blad end of the ureter as well as in the middle portio its course. The ureter has been kinked immedia below the pelvi-ureteric junction by a silk thr ich was not tied around it but merely dragged it nly out of its course. The kidney and ureter its entire length have been lifted from their bed d all the connective tissue stripped off them so it probably the nerve-supply to the ureter except h fibres as may come along the renal artery and n was destroyed. The muscular coats of the eter for some distance have been stripped off, leaving only the mucous membrane. The renal vein has been ligatured at the same time as the ureter. The renal artery has been ligatured at the same time as the ureter. On different animals the anterior and posterior divisions of the renal artery have en ligatured at the same time as the ureter. Rabbits re used in all these experiments and the left kidney d ureter in nearly every instance. In not a single periment was a hydronephrosis of the pelvic type oduced. In every case the hydronephrosis was ally of the pelvi-renal type, except when the ature was so high up as to prevent the pelvis from lating. In one group of experiments, however, condition which at first sight resembles somewhat pelvic type of hydronephrosis was produced (Fig. 8). o obtain this the operation performed consisted of posing the kidney through a lumbar incision, fining the renal artery as it lies above and behind e renal vein and following it until it divides into s two terminal branches, anterior and posterior, st before they enter the hilum. The posterior ivision which in rabbits, as in man, is the smaller f the two, though in the majority of animals it is e larger, is ligatured with fine silk; the ureter is en ligatured tightly. There is no inter-communication between the areas of the kidney supplied by the terior and posterior divisions of the renal artery, nd so the area supplied by the branch which is atured becomes an anæmic infarct. The result is at with the ureter tied and therefore the pressure ightly increased, the infarcted posterior area dilates ery much more rapidly than the anterior part which ill has its normal blood-supply. The result is eally a diverticulum of the posterior half of an rdinary hydronephrosis.

FIG. 8.



ydronephrosis; giving appearance of pelvic type hydronephrosis. Produced by ligaturing ureter and the posterior division of renal artery. Animal killed after 14 days.

The Pelvi-ureteric Junction.

I now wish to return to a consideration of the problem—Can there be a functional obstruction at he pelvi-ureteric junction in the absence of an rganic one, and if so, can this in any way be associated with the unusual dilatation of the pelvis which occurs in the pelvic type of hydronephrosis? The question of spasm at the pelvi-ureteric junction at once suggests itself, but is there a sphincter here?

In some detailed descriptions of the anatomy of the renal pelvis a ring muscle or sphincter is figured at the pelvi-ureteric junction. Ring muscles at the junction between major calices and pelvis as well as at the pelvi-ureteric junction and other places were beautifully demonstrated by Max Brödel[13] over twenty years ago. These ring muscles are not well-defined structures like the pylorus, and, indeed, many anatomists deny the presence of an anatomical sphincter at the pelvi-ureteric junction, while others do admit that there is a slight thickening of the circular muscle-fibres at the pelvi-ureteric junction and at other narrowings in the ureter. Though there may be no anatomical sphincter, this does not exclude the possibility that there may be a functional or physiological one. The presence of some such sphincter is suggested by the observations of Dardinski[14] while observing peristalsis in human renal pelves and ureters. The wave of peristalsis, as it sweeps over the entire pelvis, slows up as it reaches the pelvi-ureteric junction to become more vigorous again as it arrives at the ureter. This suggests that the neuromuscular mechanism is not quite a continuous one. The presence of this sphincter has been demonstrated experimentally in animals by Pannett,[15] by gradually dilating the ureter with fluid run into it through a fine cannula from below. The ureter dilated from below upwards from the point at which the fluid was run in, up to the pelvi-ureteric junction; here the dilatation ceased, the pelvis presumably being protected by a sphincter at the pelvi-ureteric junction. It might be thought that the renal pelvis would have a thicker wall than the ureter, and that this might account for its failure to dilate; actually the converse is true, the renal pelvis having a somewhat thinner wall than the ureter.

If there were a spasm at the pelvi-ureteric junction causing the hydronephrosis, and considering the length of time that this would have to continue, one would expect to find hypertrophy of the circular muscle at this point, but this is not found. Also, so simple an obstruction as a spasm would not be likely to cause the peculiar dilatation of the pelvis, any more than a dilatation of pelvis and kidney. Another suggested explanation is that there is some disorder of the neuromuscular mechanism of the pelvis so that the peristalsis of the calices and pelvis is disturbed, and the urine not being conveyed away gradually accumulates in the pelvis, which therefore dilates. If the peristalsis in the ureter continued to work normally, while the peristalsis in the pelvis was irregular or weak, the abrupt demarcation between pelvis and ureter which is seen in many cases could be accounted for.

Can it be that there is a congenital deficiency in the formation of the muscle of the pelvis so that it dilates more readily than the remaining portion of the kidney? This point cannot be proved, but the facts are against it, because in a certain number of the cases a very well-marked and strong peristalsis can be seen continuing in the pelvis after nephrectomy; also, microscopically, the muscle in the pelvis is seen to be well developed, and in some cases increased in amount. It is true that in specimens of an advanced degree of this type of hydronephrosis the pelvic wall is very thin, but this is due to the great dilatation.

Achalasia of the Sphincter.

The pathological explanation which appears best to cover this condition of pelvic hydronephrosis, where no primary obstruction is apparent, and even possibly some of those cases where some obstruction is present, is achalasia or lack of relaxation. This condition occurs in various parts of the body, notably the cardiac orifice of the stomach, and the colon in Hirschsprung's disease. The condition of achalasia of the cardia,[16 17] which is now, I think, a well-established entity, has been studied extensively by many workers. I will give a brief account of it in order to be able to compare the condition of idiopathic pelvic hydronephrosis with it.

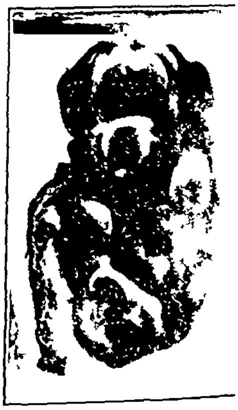
On examining specimens of the lower part of the œsophagus and cardiac end of the stomach, no well-marked sphincter can be demonstrated macroscopically, there is nothing at all comparable with the pyloric sphincter; but it is nevertheless generally agreed, and there can be no doubt of the fact, that there is a functional sphincter if not an anatomical one. It can be seen with an œsophagoscope. In a healthy person the cardia does not make itself known to us. so that we may forget its presence even during the act of swallowing. In cases of achalasia of the cardia, it is found at post-mortem examination that there is no appreciable hypertrophy of the circular muscle at the cardia, the cardia is in fact open, and water can be poured through it, there being no apparent obstruction. There is, however, the established fact of difficulty in emptying the œsophagus, and food accumulates on the proximal side of the cardia. At first there is an hypertrophy of the œsophagus above the cardia. Later this gives way to an atrophy and great dilatation. This dilatation of the œsophagus is an outstanding feature in cases of achalasia of the cardia.

Now to compare these facts about this condition with the idiopathic type of hydronephrosis, let us first consider the sphincter. As I have already said, there is a functional sphincter at the pelvi-ureteric junction, even if there is not an anatomical one; but in either case it is fairly comparable with the cardia, and in neither instance is there a well-developed powerful sphincter such as occurs at the pylorus. The natural action of the pylorus throughout a part of digestion is to prevent food passing in spite of peristalsis trying to force it through, whereas the cardia and pelvi-ureteric sphincter allow the easy passage of food and urine respectively.

In cases of hydronephrosis without apparent obstruction there is, as in cases of achalasia of the cardia, no hypertrophy of muscle found at the pelvi-ureteric junction. A further similarity between the two conditions may be noted in regard to the muscle of the renal pelvis. In the early stages of hydronephrosis there is hypertrophy of the muscle; in two cases of this condition where nephrectomy had been performed, very powerful deep peristaltic waves were seen to continue for upwards of half an hour after the kidney had been removed from the body; the pelvic wall was thickened in each case. Winsbury White,[18] in describing an early case of hydronephrosis, says a considerable degree of muscular hypertrophy can be made out; and Hinman,[5] who has done so much work on hydronephrosis, describes hypertrophy of the muscle about the pelvis as being often most pronounced and extending well up on to the major and minor calices. In the later cases hypertrophy gives way to atrophy, and a considerable degree of dilatation occurs. As already mentioned, in achalasia of the cardia there is first an hypertrophy of muscle in the œsophagus, followed by atrophy and dilatation.

One authority, to whom I have already referred, has said that the inflammatory changes in the pelvis and ureter can quite easily explain all the changes which occur in hydronephrosis from the inception of the disease to its termination. Undoubtedly a stricture at the pelvi-ureteric junction due to chronic inflammation or to any other cause will bring about a hydronephrosis, but the theory will not explain why the dilatation is of the pelvic type. If there is inflammation present from the inception of the disease, I think one would expect the hydronephrosis to be of the renal type owing to thickening and fibrosis of the pelvic wall; in a typical case of the renal type of hydronephrosis due to a calculus, this is the probable and, I believe, the usually accepted reason why the pelvis does not dilate, for it is chronically inflamed and thickened around the stone; this is not only so when the stone is in the pelvis, but also when it has slipped further down the ureter (Fig. 9). To digress for a moment to the gall-bladder, a parallel may be drawn—in cases of obstruction to the common bile-duct where there is a diseased, that is a chronically inflamed gall-bladder, the latter does not dilate as it does when it is healthy, this condition, of course, being seen, for example, in cases of malignant obstruction to the comm duct. It seems more probable that the infla mation which is so often associated with hydr nephrosis is not primary and is not the cause the condition, but that it is the result of so stagnation of urine within the pelvis, and therefore, secondary to the hydronephrosis. As h already been mentioned, in some of these cases the pelvic type of hydronephrosis, the pelvi-urete junction is not obstructed, though in others there is narrowing, and sections at this point show signs chronic inflammation. Now if the hydronephrosis due to an achalasia, as I believe, when the infecti which is secondary to the stagnation of urine occu there will be an inflammatory thickening not only the renal pelvis but also of the adjacent portion the upper end of the ureter. As time goes on and t pelvis dilates it becomes so stretched that an app ciation of the inflammatory thickening is lost, wh the pelvi-ureteric junction still shows this thickeni and so to some extent narrowing, because it does n dilate owing to its want of muscular relaxation achalasia. Now is there any further explanati why the pelvis would dilate in cases of achalasi Can it be associated with some irregularity of nervo control ?

FIG. 9.



Renal type of hydronephros with calculus in ureter. Th renal pelvis is not dilated.

THE NEUROMUSCULAR MECHANISM.

The nerve-supply of the pelvis and ureter com from the renal plexus; the spermatic and hypogast plexuses also supply the ureter in its lower pa There seems no doubt that there is a parasympathet as well as a sympathetic nerve-supply; Kuntz from his extensive studies of the autonomic nervo system, says it is abundantly supplied by nerves bo of sympathetic and parasympathetic origin, but th rôle is little understood. From the action of vario drugs on the ureter, Macht[20] concludes that the is evidence of innervation by the true sympathet system and the parasympathetic system, and t response of the ureter to nicotine points to the presence of ganglion cells in its wall. Like other smooth muscle viscera, the ureter and pelvis possess the inherent capacity to undergo rhythmic contraction, but their activity is probably subject to regulating nervous impulses. The dynamic theory, as it has been called, attributes the cause of hydronephrosis to "primitive disorders of the pyelo-ureteral peristalsis." The experimental investigations of Blatt[21] appear to show that the peristalsis of the ureter, and of the pelvis, is regulated by the neuroganglionic motor centres placed within its wall; and that the lesion of these centres gives place to pyelo-ureteral dilatation by paralysis and muscular atony. Such a lesion would account for the dilatation affecting mainly the pelvis, and the calices only to a lesser degree. Can the condition be due to some lesion of the autonomic nervous system? Overaction of the sympathetic control of a muscular tube produces a relaxation of the tube with failure of relaxation of the sphincter below. Now if this condition were present it might well produce a hydronephrosis; there would be an obstruction at the functional sphincter of the pelvi-ureteric junction, and dilatation of the pelvis would take place more readily than of the kidney owing to the abnormality in its nervous control. Harris and Harris,[22] of Sydney, have performed renal sympathectomy in a number of cases, some of which showed dilatation of the renal pelvis. It is true that these cases mostly had pain, a thing which is so often absent in the early stages of hydronephrosis. These patients obtained relief from their symptoms.

Therefore, in an endeavour to suggest a cause for this condition of hydronephrosis, it seems to be necessary to attribute it to some disturbance of the neuromuscular mechanism, mainly because no other explanation appears to account either for the special dilatation of the pelvis or the presence of dilatation, in some cases, without mechanical obstruction. And it is believed that the various causes which have been or are put forward from time to time are secondary to the hydronephrosis and not the primary cause.

There is scarcely a disease in the whole of medicine the exact cause of which is known. In this respect, therefore, hydronephrosis falls into line with most other diseases. It seems probable, however, that in the case of hydronephrosis help is most likely to come from further investigations into the anatomy, physiology, and pathology of the neuromuscular mechanism of the renal pelvis and ureter.

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THE TREATMENT OF RHEUMATOID ARTHRITIS WITH GOLD SALTS INJECTIONS.

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The treatment of rheumatoid arthritis is without doubt one of the most difficult problems in modern medicine, and in spite of the improvement in recent years the number of invalids due to this disease in most countries remains very high, and causes considerable expense to the States. The treatment of arthritis by physiotherapy undoubtedly remains one of the best methods, but the recent introduction of shock therapy has been an advance, and this has been followed by the extensive use of vaccines. The treatment is based on the fact that rheumatoid arthritis is in most cases due to an infective organism. Although some physicians differentiate between true rheumatoid arthritis—a disease affecting mostly women during the child-bearing period, and accompanied by intense vasomotor disturbances—and infective arthritis, occurring in old people causing little vasomotor disturbances, there does not seem to be any distinct difference between those forms.

Stock vaccines have been tried on a small scale in France, mostly streptococcal, but autogenous vaccines in England have not met with much enthusiasm. This treatment, which was once favourably accepted in England and the United States, seems to have led to disappointment. Most of these vaccines are collected from infective foci, which is not really a scientific method and does not produce the "pathogenic organisms" which cause the disease.

Recently treatment with chemical compounds has been tried: iodine intravenously; ammonium orthoxybenzoate in the United States, and iodalcoylates in France. This method gave some favourable results, but the need to repeat daily injections during months has robbed it of its practical value.

Chemotherapy has always appeared to me likely to be of great help in treating rheumatoid arthritis, since it is efficient in infective diseases, such as syphilis or tuberculosis. A certain amount of similarity between the latter disease and rheumatoid arthritis—i.e., impairment of the general condition, anæmia, leucocytosis, and temperature—led me to believe that some forms of treatment which had proved valuable for tuberculosis could help in the treatment of rheumatoid arthritis. This is why in 1928 I began to treat such patients with gold salts, the method introduced in treating pulmonary tuberculosis by Mollgaard in 1914. Only after I had commenced my work did I hear of the experiments of Feldt in Germany, who showed the curative action of injections with gold salts for experimental streptococcal infections in rabbits.

The gold compound which we have used is not the thiosulphate of sodium and gold used by Mollgaard and known in medicine under the name of sanocrysin, which can be used only intravenously. We have injected sodium aurothiopropanol sulfonate, which has been produced by A. Lumière, and is known under the name of allochrysine; its chemical formula is:

$$\begin{array}{ll} CH_2—SAu & CH_2—SH \\ CH—OH & CH—OH \\ CH_2—SO_3Na & CH_2—SO_3Na \end{array}$$

There is a direct connexion between the gold and the sulphur which does not exist in thiosulphate. Allochrysine is slightly toxic, the lethal dose being 10 cg. per kg. in the case of a guinea-pig.

The gold salts treatment has proved of great value in all forms of infective and rheumatoid arthritis. We have especially directed our attention to the severe forms of the disease when numerous joints were affected, very often symetrically. Out of 48 cases, the result of which we shall report, only 40 per cent. were cases of less than two years' duration, 30 per cent. were of two to five years' duration, and 30 per cent. were of over five years' duration. In the first class of cases, where the disease is still in its infancy, there are synovial changes only, while cartilages and bones are still unaffected. When therefore the progress of the arthritis is stopped, recovery is complete, while in the older cases, when changes in the cartilages, displacements, and subluxations have taken place, there always remains a certain amount of functional impairment, even when the disease has been arrested.

LABORATORY TESTS.

Clinically we have found a moderate increase of temperature in 35 out of 48 patients; in only 10 per cent. of them was it possible to detect a definite focus which could be regarded as the cause of the disease. We have done a considerable amount of bacteriological research in the natural cavities of our patients and have made blood cultures; no great results were observed in spite of the fact that we frequently found streptococci, mostly of the *viridans* type, in the cavities; blood cultures were constantly negative.

We have observed in most of our cases a moderate anæmia and a definite leucocytosis, sometimes more than 20,000 per c.mm., a finding which confirms the investigations of Kahlmeter in Sweden. (Table I.) But the most striking feature of the changes in the blood of our patients was that of the resorcin flocculation test of Vernes, and of the sedimentation rate of the red corpuscles.

TABLE I.—*Hæmatological Examination Before and After Treatment (18 Cases).*

		Red corpuscles in millions per c.mm.			Leucocytes in thousands per c.mm.		
Corpuscles.		*3 to 4*	*4 to 5*	Above 5	*5 to 10*	*10 to 15*	Above 15
Cases	Before	5	14	0	1	6	12
	After	4	15	0	6	11	2

The resorcin flocculation test, which in a normal subject is below 30 with the Vernes method, has been over 40 in 80 per cent. of our cases, and sometimes up to 80 and 120. The sedimentation rate of the red corpuscles tested with the Westergren method is in normal subjects 3 to 6 mm. in one hour; it shows normal figures in osteo-arthritis, neuritis, and fibrositis. In rheumatoid arthritis, during the progress of the disease, 20 per cent. of the patients show figures between 20 and 30 mm., 30 per cent. between 30 and 50, 26 per cent. between 50 and 80, 5 per cent. being above this figure, sometimes up to 120 mm. Only 16 per cent. are between 20 mm. and 10 mm., which is already abnormally high, the average figure being 42 mm.

These two tests, which are not specific and are generally positive in infectious diseases and in tuberculosis, are most useful, not only from the diagnostic point of view but from the point of view of prognosis, and we test the blood of our patients at regular intervals to follow the effects of the treatment.

Other tests on the blood of these patients are generally negative; there is a slight exception with the complement-fixation test for gonococcus, which we have performed in a certain number of cases and which may be slightly or strongly positive in about 10 per cent. of the cases, sometimes quite unexpectedly. Our experience in this respect is still too limited, and we cannot draw definite conclusions, as Léri has done lately, but as far as the Wassermann test and the other serological tests for syphilis are concerned, they have been constantly negative, and our personal experience has been confirmed by our findings at the Cochin Hospital in Paris with Coste and Lacapère.

Syphilis does not seem to have any importance in the ætiology of rheumatoid arthritis; it would be very desirable to make a serological test for tuberculosis, but unfortunately none of the available methods can be considered specific. The resorcin test has been proposed by Vernes for the diagnosis of tuberculosis. The increase in the sedimentation rate has been observed in the same disease, but no definite conclusion can be drawn from it. Notwithstanding this, we are convinced that tuberculosis has more influence on the onset of rheumatoid arthritis than syphilis.

The result of chemical researches on the blood has been equally negative: in 24 cases we have had the following results:—

Urea.—Minimum, 0·28; maximum, 0·54; average 0·4 per 1000 c.cm.

Uric acid.—Minimum, 0·032; maximum, 0 072; averag 0·043 per 1000 c.cm.

Cholesterin.—Minimum, 1·57; maximum, 2·40; averag 1·80 per 1000 c.cm.

These figures prove our statement that there i *no gross metabolic change.* In 15 cases where th basal metabolism was tested we did not find figure outside the normal limits.

METHOD OF TREATMENT.

Patients intended for treatment with gold salt after having undergone a careful clinical examinatio were submitted to the various tests which we hav described, and the best results seem to have followe when there was a slight increase in temperatur moderate leucocytosis, and an increased sedimentatio rate. Where some definite focal infection wa detected, it was attended to before starting th treatment with gold salts; teeth were extracte and infected nasal sinuses cleaned up; in tw instances tonsils were removed.

The injections of allochrysine were given intra muscularly, generally into the gluteal muscles, an did not cause any pain or local reaction. The firs series consists of three injections of 5 cg. at an interv of five days; if these injections do not cause an reaction, the series is continued by weekly injectio of 10 cg. up to a total of 1·50 g. or 2 g., dependin on the tolerance. Such a series lasts about thre months. No more than 2 g. are given, and the dail dose should not exceed 2 cg., to prevent any tox effect—for example, 5 cg. every fifth day would mea a daily dose of 1 cg.; 10 cg. every fifth day woul mean a daily dose of 2 cg. When this first series completed it is essential to give the patient a re from any injections for six or eight weeks; afte this period a second series similar to the first is give with the same rest interval at the end. When a result has been obtained it is essential to continue the treatment by subsequent series of 10 to 20 weekly injections of 10 or 5 cg. for a year or two.

The effect of the treatment is controlled by careful clinical examination and a study of the changes in the temperature curve, when there is a moderate temperature, but the best control is undoubtedly the blood examination. The decrease in the white blood corpuscles is a good prognostic sign, but even better is the decrease of the sedimentation rate of the blood corpuscles. This is the most reliable and sensitive test for the control of the treatment; whenever the sedimentation rate remains decidedly high, above 20 mm. for the first hour, it is certain that the progress of the disease has not stopped.

On the other hand, we consider that a patient affected with rheumatoid arthritis in whom the sedimentation rate has come back to normal figures (under 10 mm. during the first hour) may be considered cured if these normal figures have been constant for over a year after the completion of the treatment. We advise testing the sedimentation rate of the patients during the treatment at least once a month and, later on, once every second month.

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The effect on the general condition is generally very remarkable; a high percentage of our rheumatic patients were pale, with a sallow café au lait colour. After three months' treatment their colour became normal and they looked much stronger and less depressed.

The action on the joints is different in cases of short and long standing; in the first, when there was only a synovial swelling, this disappeared progressively in two or three months in favourable cases and the joints became completely normal again. In the older cases, where subluxations and stiffness accompanied chronic inflammation of the joints, the latter changes disappeared but the former were only slightly modified.

The main cause of invalidity among rheumatic patients is the pain on active and passive movements; this progressively diminished after one month or more, and from that time the movements of the different joints were greatly improved. Three patients who had been bedridden for four to six years were able to stand up and walk a few steps after the first series of treatment. By judging the amount of aspirin which patients take for their pains, so that they can go about their daily life, one can observe any improvement which takes place. In our experience two out of three of our patients who were taking six to eight tablets of grs. x every day could come down little by little to one or two tablets, and later on were able to discard them entirely. The body-weight showed in some cases an increase of a few pounds, but other patients lost a little weight when they were able to make a larger amount of physical exertion.

Like the treatment with mercury, bismuth, and arsenic, the gold salts also may cause reactions against which one should be on guard. Sometimes an increase of temperature and temporary rashes may occur; these appear in certain sensitive patients for no reason, and could be considered as anaphylactic phenomena; they did not prevent us from continuing the treatment.

Sometimes after six to eight injections toxic changes occurred. They consisted of two kinds: those on the mouth and those on the skin. We observed in 20 per cent. of cases a mild form of stomatitis with erosion of the lips and tongue, which was only severe in four cases. The skin reactions were mostly morbilliform rashes, and in five instances erythrodermia with subsequent desquamation. These various changes have been observed in 13 out of 26 cases, at the beginning of the experiment, when we were using daily doses which were three times or twice as large as that we have described. With our usual doses they occur very seldom (3 out of 22 cases), and they are of the very benign type provided one is careful. One should always ask the patient when an injection is to be made whether the preceding one has caused any irritation in the mouth or on the skin; if there is the least doubt about it, the next injection should not be given, and a sufficient length of time should elapse before the treatment is resumed. To prevent any affection of the mouth, the patients should clean their teeth with a tooth-paste containing arsenic.

EFFECTS OF THE GOLD TREATMENT.

The following results have been obtained after an experience of three years. Altogether they may be considered as very satisfactory considering the percentage of cases which have been not only greatly improved but almost clinically cured. Table II. sums up the results.

Very good results have been obtained in 17 cases; the patients were clinically free from symptoms, and every sign of progress of the disease disappeared in cases of short duration. In some cases we were so fortunate as to restore the use of the limbs, and the swelling of the joints disappeared, but as rheumatoid arthritis may persist for several years one does not feel justified in speaking of a cure.

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Negative ..	—	—	—	—	1	1	4
Moderate ..	3	4	1	—	2	10	—
Good ..	1	6	4	—	5	16	—
Very good.	2	4	3	4	4	17	—
Total cases	6	14	8	4	12	44	4

The very good cases and good cases number 33, or 70 per cent., and this percentage can be considered as a definite advance in the treatment of rheumatoid arthritis. The balance of our cases include ten partial results and five negative results. In three cases there was a temporary improvement followed by a relapse; of the disappointing results, most of the patients had not had sufficient treatment for one reason or another; in only one of them had the

There is a direct connexion between the gold and the sulphur which does not exist in thiosulphate. Allochrysine is slightly toxic, the lethal dose being 10 cg. per kg. in the case of a guinea-pig.

The gold salts treatment has proved of great value in all forms of infective and rheumatoid arthritis. We have especially directed our attention to the severe forms of the disease when numerous joints were affected, very often symetrically. Out of 48 cases, the result of which we shall report, only 40 per cent. were cases of less than two years' duration, 30 per cent. were of two to five years' duration, and 30 per cent. were of over five years' duration. In the first class of cases, where the disease is still in its infancy, there are synovial changes only, while cartilages and bones are still unaffected. When therefore the progress of the arthritis is stopped, recovery is complete, while in the older cases, when changes in the cartilages, displacements, and subluxations have taken place, there always remains a certain amount of functional impairment, even when the disease has been arrested.

LABORATORY TESTS.

Clinically we have found a moderate increase of temperature in 35 out of 48 patients; in only 10 per cent. of them was it possible to detect a definite focus which could be regarded as the cause of the disease. We have done a considerable amount of bacteriological research in the natural cavities of our patients and have made blood cultures; no great results were observed in spite of the fact that we frequently found streptococci, mostly of the *viridans* type, in the cavities; blood cultures were constantly negative.

We have observed in most of our cases a moderate anæmia and a definite leucocytosis, sometimes more than 20,000 per c.mm., a finding which confirms the investigations of Kahlmeter in Sweden. (Table I.) But the most striking feature of the changes in the blood of our patients was that of the resorcin flocculation test of Vernes, and of the sedimentation rate of the red corpuscles.

TABLE I.—*Hæmatological Examination Before and After Treatment (18 Cases).*

		Red corpuscles in millions per c.mm.			Leucocytes in thousands per c.mm.		
Corpuscles.		3 to 4	4 to 5	Above 5	5 to 10	10 to 15	Above 15
Cases	Before	5	14	0	1	6	12
	After	4	15	0	6	11	2

The resorcin flocculation test, which in a normal subject is below 30 with the Vernes method, has been over 40 in 80 per cent. of our cases, and sometimes up to 80 and 120. The sedimentation rate of the red corpuscles tested with the Westergren method is in normal subjects 3 to 6 mm. in one hour; it shows normal figures in osteo-arthritis, neuritis, and fibrositis. In rheumatoid arthritis, during the progress of the disease, 20 per cent. of the patients show figures between 20 and 30 mm., 30 per cent. between 30 and 50, 26 per cent. between 50 and 80, 5 per cent. being above this figure, sometimes up to 120 mm. Only 16 per cent. are between 20 mm. and 10 mm., which is already abnormally high, the average figure being 42 mm.

These two tests, which are not specific and are generally positive in infectious diseases and in tuberculosis, are most useful, not only from th diagnostic point of view but from the point of vie *of prognosis, and we test the blood* of our patien at regular intervals to follow the effects of th treatment.

Other tests on the blood of these patients a generally negative; there is a slight exception wi the complement-fixation test for gonococcus, whi we have performed in a certain number of cases a which may be slightly or strongly positive in abo 10 per cent. of the cases, sometimes quite une pectedly. Our experience in this respect is still t limited, and we cannot draw definite conclusions, Léri has done lately, but as far as the Wasserma test and the other serological tests for syphilis concerned, they have been constantly negati and our personal experience has been confirn by our findings at the Cochin Hospital in Paris w Coste and Lacapère.

Syphilis does *not seem to* have any importa in the ætiology of rheumatoid arthritis; it wo be very desirable to make a serological test tuberculosis, but unfortunately none of the availa methods can be considered specific. The reso test has been proposed by Vernes for the diagn of tuberculosis. The increase in the sedimentat rate has been observed in the same disease, but definite conclusion can be drawn from it. Notw standing this, we are convinced that tubercul has more influence on the onset of rheumat arthritis than syphilis.

The result of chemical researches on the blood been equally negative: in 24 cases we have had following results:—

Urea.—Minimum, 0·28; maximum, 0·54; average per 1000 c.cm.
Uric acid.—Minimum, 0·032; maximum, 0·072; av 0·043 per 1000 c.cm.
Cholesterin.—Minimum, 1·57; maximum, 2·40; ave 1·80 per 1000 c.cm.

These figures prove our statement that ther no gross metabolic change. In 15 cases where basal metabolism was tested we did not find fig outside the normal limits.

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The patients who have been able to stand several series of treatments have got the best results, their total dose being 3, 4, or 5 g. of allochrysine; 9 out of 12 patients who received over 4 g. of gold salts have been considerably improved. Of the cases who received less than 1 g., 50 per cent. show poor results and 50 per cent. good results.

Judging the question from a clinical standpoint, we can state that after two series of 1·50 g. or 2 g. doses, it is useless to continue the treatment if the patient has not already obtained some definite improvement; when this improvement has been obtained, it is well worth while to continue the treatment, not only until the patient is free from symptoms, but for several months after the different biological tests, and especially the resorcin test and the sedimentation test, have come back to normal figures.

INDICATIONS AND CONTRA-INDICATIONS.

The treatment is justified in all cases of rheumatoid arthritis or infective peri-arthritis, as long as the disease is developing; its development is shown by clinical symptoms: pains, stiffness, swellings, disability, anæmia, and sometimes moderate increase of temperature, checked by blood examinations. Cases which respond best to the treatment are those accompanied by leucocytosis, high resorcin flocculation test, and accelerated sedimentation rate. Such cases of rheumatoid arthritis may be treated with great success in almost 70 per cent. of cases and with practically no danger, provided the liver and kidneys are in good condition and the blood pressure is not exceedingly high.

We have treated young patients and old patients. One patient over 70 responded favourably to small doses of 5 cg. per week; it is common to find that the development of arthritis in old people is not so severe as in middle-aged people.

Albuminuria.—Gold salts are contra-indicated in cases where tests show that the function of the kidney is greatly impaired.

Osteo-arthritis.—Whatever its localisation may be —hip, knee, or phalanges—osteo-arthritis is quite a different disease from rheumatoid arthritis, and where the blood is practically normal from the point of view of leucocytosis, the resorcin flocculation test and sedimentation rate, the gold treatment is not indicated. The same may be said of neuritis and fibrositis.

We do not consider that gold salts treatment should be given without the other treatments for arthritis, especially massage with active and passive movements; all kinds of physiotherapy prove of great value as an aid to the method. Hydrotherapeutic treatment—sulphur baths, douche-massage, mud baths—has been used by 60 per cent. of our patients, and has certainly helped to bring about a rapid improvement of the functions.

The method cannot be compared with shock therapy, as it does not cause any such reaction in most of the cases; it seems to be much nearer to the Metalsalt therapy which has been suggested by Walbum, of Copenhagen, from animal experiments.

In all the reported cases treatment has been given in the form of allochrysine injected intramuscularly; in a limited number of other cases which are not reported here, we have used thiosulphate of sodium and gold (sanocrysin, Crisalbine) injected intravenously; the results have been almost the same. We believe that the active element in those preparations is the metal gold, which is chemically combined with the sulphur, re-inforcing its action; those two chemical compounds of gold, sanocrysin and allochrysine, improve the action of the metal just as salvarsan improves the action of arsenic. Where colloidal gold has failed, allochrysine succeeds; it may be regarded as the best chemical for the treatment of rheumatoid arthritis.

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THE DETECTION OF PRESYMPTOMATIC TUBERCULOSIS IN CHILDREN.

By Ernest Fletcher, M.B. Camb., M.R.C.P. Lond.,

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The trend of modern work in tuberculosis lies largely in the direction of early diagnosis. Ideally, the infection must be detected before symptoms appear, for treatment at this stage holds out great hope of complete cure. In the case of children, radiology and the tuberculin test are the two most important means of securing early recognition.

In 1930 Kerley[1] read a paper to the British Institute of Radiology, in which he described the radiological appearances. His work, however, was done among patients of the Royal Chest Hospital, so that he was necessarily dealing with people who were ill and knew they were ill. *It is not among these that we must look primarily for the presymptomatic stages of tuberculosis.*

In order to investigate normal children, I selected 50 cases from the children's consultation centre at the St. Marylebone General Dispensary, who, although they had in times past attended th dispensary for various ailments, were at the time o their examination, so far as they or their parent knew, healthy. In order to obviate, as far as possible the objection that this is not a series of health children, Table I. shows the ailments for which thes children originally attended the dispensary. A glanc at Table I. suggests that there can be few childre who have not, at some time, attended a doctor or a hospital for ailments of this type.

TABLE I.

Ailments.	Children.	Ailments.	Children.
Cough	9	For examination ..	6
Nasal catarrh ..	4	Under weight ..	6
Tonsillitis	6	"Nerves"	2
Headaches	2	Glands in neck ..	1
Wax in ears ..	1	Enuresis	1
Scoliosis	1	Erratic behaviour ..	3
Diarrhœa and vomiting	1	Strabismus	1
Fractured humerus ..	1		
Poor appetite ..	*5*		*50*

In no case had the *original examination* revealed any sign of organic disease. These children were chosen because they were the first 50 children on the follow-up list who had not attended the Dispensary recently; they all came from London boroughs.

EXAMINATION ROUTINE.

The same routine was followed in each case. A thorough clinical examination was made, and any statements as to the child's health by the parent were duly recorded. The child was then sent for radiological examination. If either of these examinations showed anything abnormal, a tuberculin test was done.

Perhaps a note of explanation is needed here. The tuberculin test is usually considered the method of choice when sorting out children for these investigations. In most cases the test is done, the children are divided into two classes, reactors and non-reactors, and the investigation proceeds from this point. In other cases the test is done to pick out the non-reactors, and they are taken as showing signs or appearances which may be considered normal. Most authors follow this sequence on account of the expense involved in radiological examination of large numbers of children. It is somewhat difficult to determine the percentage of children who, reacting to tuberculin, also show radiological evidence of tuberculosis, as compared with those who, being non-reactors, still show radiographic evidence of the disease. But in view of findings[2, 3] at the Henry Phipps Institute in Philadelphia it seemed to me better to take X ray evidence as the starting point. In cases where there was any suspicion of non-tuberculous infection of the lung, a lipiodol injection was made.

For the purposes of this paper, those children who were found on clinical examination to have signs of bronchial catarrh, but whose radiological examination and tuberculin test were negative, have been classed as normals. Films were taken of each case. Where the term "fibrosis of the lungs" is used in this paper, non-tuberculous fibrosis is meant.

The *tuberculin test* was made intradermally by the method of Mantoux.[4] Pirquet's method has been repeatedly shown to give a smaller percentage of reactors. 0·1 c.cm. of 1 in 10,000 O.T. was injected intradermally; if no reaction followed, 0·1 c.cm. of 1 in 1000 was injected; if this again was negative, 0·1 c.cm. of 1 in 100 was injected, which is equivalent to 1 mg. A reaction which included a ring of erythema 10 mm. wide, with some œdema and raising of the skin, was classed as + ; if the ring was as large as 15 mm. it was classed as ++. No other type of reaction was found in the series. In practice no child actually reacted to the third dose who had not reacted to one of the first two.

Tubercle bacilli.—In no case were tubercle bacilli found in the sputum.

Ages.—The average age of the children of the series was 7·3 years. All except four were between the ages of 5 and 12.

RESULTS.

The results of the examination were as follows :—

Normals	37	(74 %)
Tuberculosis of childhood	4	(8 %)
Apical infections	—	—
Fibrosis of the lungs	5	(10 %)
Enlarged mediastinal glands	4	(8 %)
	50	(100 %)

That is to say, that out of 50 cases examined, 13 had demonstrable lesions of the lung, of which 8 were tuberculous and 5 were non-tuberculous.

Clinical examination.—The number of cases showing physical signs was 13. Of these, 9 showed scattered râles brought out on coughing only; 1 showed diminished air-entry to the right upper and middle lobes, and is classed as tuberculous; 3 showed impaired percussion note at one base with post-tussive crepitations, and are classed as fibrosis of the lungs.

The *tuberculin test* was done in 20 cases; of these 12 were positive and 8 were negative. Of the positives 7 were + and 5 were ++.

Of the 7 who were + : 1 was a case of fibrosis of the lungs (5); 2 were cases of tuberculosis of childhood (22, 37); 2 were cases of enlarged tracheo-bronchial glands (23, 27); and 2 were normals, one of whom had enlarged cervical glands (25, 12).

Of the 5 who were ++ : 1 was a case of tuberculosis of childhood; and 4 were apparently normals.

Of the 8 who were negative : 1 was a case of tuberculosis of childhood; 1 was a case of non-tuberculous fibrosis; 1 showed enlarged mediastinal glands; and 5 were normals.

The incidence of exanthemata and other diseases was as follows :—

	Measles.	Whooping-cough.	Lung infections.	Other diseases.
Normal group ..	81 %	62 %	44 %	10 %
Abnormal group	83 %	66 %	50 %	6 %

Table II. shows details of the cases classed as tuberculosis of childhood, enlarged glands, and non-tuberculous fibrosis.

Contacts.—Only one case (No. 5) gave a history of contact with open tuberculosis, and this proved to be a case of non-tuberculous fibrosis. The tuberculin reaction was +. Two cases gave a family history of tuberculosis. One proved to be a non-tuberculous fibrosis, and the other was a case of tuberculosis of childhood. One author states that 91 per cent. of cases showing latent tuberculous lesions had no history of contact.

Underweight.—The question of the relationship of underweight to tuberculous infection in children is not settled. The balance of evidence is that there is no connexion between the two. Barnard, Amberson, and Loew[5] say that in their series of children the smallest number of reactors to tuberculosis was in those children who were underweight. No definite connexion was found in the present series between underweight and latent tuberculosis, or enlarged mediastinal glands.

Percentage of lesions found.—In the present small series 16 per cent. of the cases showed either latent lesions or enlarged mediastinal glands. It must be borne in mind that the cases were selected for further examination by X rays, and not by the tuberculin test.

CLINICAL EXAMINATION.

Attempts have been made to discover signs or symptoms which may accompany a change of reaction to tuberculin. The signs described as pathognomonic of enlarged tracheo-bronchial glands are indefinite, and although one has repeatedly tried to make the diagnosis before the X ray picture was taken, the number of correct diagnoses is small. It proved possible to diagnose only one out of four cases of latent tuberculosis by clinical examination alone, and three out of five cases of fibrosis of the lungs. In the four cases of enlarged mediastinal glands there appeared to be no physical signs.

The results of the intracutaneous tests have been given. It will be seen that three out of four cases of latent lesions gave a positive test to 0·1 mg. Out of four cases of enlarged tracheo-bronchial glands, two gave a positive reaction and two gave a negative reaction to 1·0 mg. of O.T. Some authors advise the standardisation of tuberculin. The tuberculin used in this series was supplied by Burroughs and Wellcome, and is stated to be standardised by guinea-pig injection. Out of seven cases, all of them finally regarded as being almost certainly potentially or actually tuberculous, three, or 42 per cent., gave a negative reaction to a large dose of O.T. The test was not done in one case of enlarged glands.

TABLE II.

Case	Age and sex.	Family history.	Clinical examination.	Tuberculin test.	Result.	Remarks.
Cases of Tuberculosis of Childhood.						
3	3, F	Good.	Rhonchi both bases.	+ +	Resolution.	—
8	12, M	Father had rheumatic fever.	L. upper lobe hyper-resonant. Scattered rhonchi.	—	Complete resolution.	In bed 3/12.
37	5, M	Good.	Lungs clear. Signs of healed rickets.	+	Complete resolution.	In bed 1/12 in hospital, 2 at home.
22	12, F	Father had "pleurisy," in good health now.	Diminished air entry. R. upper and middle lobes.	+	Improvement. Radiological appearances cleared.	—
Cases of Enlarged Mediastinal Glands.						
23	6, F	Good.	Teeth carious. Nil else.	+	Good.	Mastoid operation, aged Right-sided glandu enlargement.
24	7, F	Good.	Nil.	Not carried out.	—	Bilateral case.
27	11, M	S. has tuberculous cervical glands.	Very pale.	+	—	Right-sided enlargement
48	3, M	Good.	Nil. ? underweight.	—	—	Bilateral case.
Cases of Pulmonary Fibrosis.						
					PAST HISTORY.	
4	8, M	Good.	Tonsils + and red. Crepitations right base.	N.D.	"Pneumonia," aged 18/12. Measles, aged 4. Bronchitis, aged 5.	Has had pyrexial att at frequent inter Lipiodol injection.
5	5, F	Good.	Tonsils red.	+ve.	Measles and broncho-pneumonia, aged 2. Bronchitis, aged 4. Bronchitis, aged 5.	Two sons of landlady of phthisis when Cas aged 1. Lipiodol inject
9	8, M	Father died of "asthma."	Rhonchi on coughing at both bases.	Not done.	Bronchitis, aged 4. Measles, aged 6.	Lipiodol injection.
13	5, M	Mother and father both had "pleurisy," now alive and well. Phthisis in father's family.	Nil.	Not done.	Whooping-cough at age 3. Measles, aged 4.	" "
28	5, F	Good.	Impaired percussion note, left base. Crepitations on coughing.	—ve.	Measles, aged 1. "Pneumonia" (twice), aged 2. Whooping-cough, aged 4.	" "

RADIOGRAPHY.

Cases of tuberculosis of childhood.—Out of the four cases described, two are of a similar nature (Nos. 8 and 37). In both cases serial films are shown, demonstrating the complete clearing of the lesion (Figs. 1 and 2). In Case 8 the lesion involves the base of the upper lobe of the left lung. The appearance is that of consolidation.

A first picture was taken on Nov. 10th, 1930, and ten days later a second picture (Fig. 1A) showed that the consolidation had increased in size very considerably; the shadow at the hilar end was much denser and extended right out to the radiological periphery of the lung, the direction being upwards and outwards, cutting the axillary border at the third rib. The child was put to bed, for it is uncertain whether consolidations of this type are going to retrogress. In one month the lesion had begun to clear. In an antero-posterior view it appeared to be stationary both at the hilar and peripheral ends, and to clear in the centre, the lower edge being still uniform. A picture one month later shows the consolidation cleared, except at the hilar end, and four weeks later the appearances are normal (Fig. 1B).

It seems that the consolidation was only just commencing when the child was first seen, for the second picture showed a spread. If this was so, the whole process of infection and resolution took place in slightly over three months.

The second case of the same type (No. 37) showed the consolidation in the right lung.

The first picture (Fig. 2A) shows the lesion involving the lung right out to the periphery; the second picture (Fig. 2B), three weeks later, shows almost complete retrogression. It seemed that the middle lobe was involved as well in this case, and the original picture appear indicate some involvement of the diaphragmatic ple The whole lesion completely resolved, and a lipiodol injec made five months later shows no involvement of the bro There was stated to be some loss of weight in this c but it is difficult to be sure on this point.

These two cases are similar in almost every resp except that one child was 12 years old and the ot was 5. The sudden onset without symptoms, the of clearing, and the uniform consolidation suggestive of a similar mechanism.

The third case (No. 22) is of a different orde

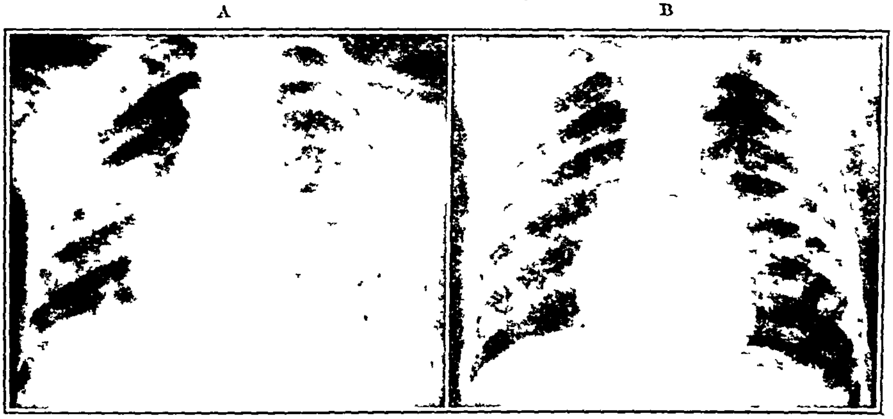
The child was a girl, aged 12, of delicate appeara The tuberculin reaction was +, and she had a fa history of pleurisy on the father's side, without any ac open tuberculosis. She said "she was always tired," had no actual symptoms apart from this. The radiolog appearances consisted of an area of soft infiltration u the second rib on the right side, only a few millimetre diameter, with involvement of the tracheo-bronchial gla Further, there was definite thickening of the interlo pleura. Five months later, the peripheral lesion completely cleared, and the interlobar pleura had resu its normal appearance. There was at this time radiological evidence of enlarged glands.

This child had occasionally been brought up by mother at irregular intervals, so that we had some rec of her weight over a period of time. There was no cha in the weight curve; it shows a perfectly steady rise all time.

The last case (No. 3) was a girl, aged 3, wit good family history. Her mother said she always had a cough, so that she took no notice of t t did not appear to be any worse than usual at the resent time.

The tuberculin reaction was ++. This child howed a wedge-shaped consolidation in the right ung, of uneven density, with mottled spots most oticeable at the level f the fourth rib in ront; spots of infiltration were present in the periphery of the lung at the same level. She has, I believe, gradually recovered, but I have no plate showing the appearances after resolution. There was no evidence of enlarged glands.

FIG. 2 (Case 37).

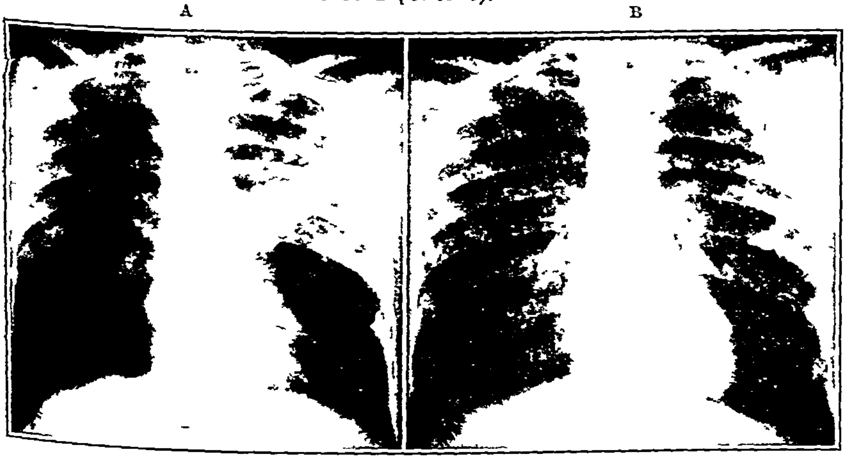


A, Large consolidation involving two and possibly three lobes of the right lung. Note tenting of the diaphragm. B, Five months later. The lesion has completely resolved

Cases of enlarged glands.—Of these, two (Nos. 23 and 27) are probably bilateral, and the other two are right-sided. Apart from the radiogram there was nothing to distinguish these cases. The two bilateral cases complained of being nervy or tired occasionally, and one child was very pale. The red cell count, however, was 5,000,000, and there was a relative lymphocytosis. The sedimentation curve was within normal limits.

Cases of fibrosis.—It is somewhat surprising to find so many early cases of fibrosis. Inasmuch as these are generally considered to be the result of past inflammations, I append a note of the number of attacks—pyrexial in nature and pulmonary in localisation—from which these children have suffered, as compared with the remainder of the series.

FIG. 1 (Case 8).



A, Large consolidation running upwards and outwards in the base of the left upper lobe. The consolidation is uniform, and reaches the radiological periphery of the lung. B, The condition three months later, showing the lesion completely cleared.

	No of attacks per child.
Fibrosis of the lungs	Average 3·0
Remainder	„ 1·8

These children have had slightly more than one attack over their share. This figure includes measles and whooping-cough.

CONCLUSIONS AND SUMMARY.

1. A survey has been made of 50 children, mostly of school age, who, although they have been patients at the Marylebone Dispensary, were at the time they were sent for considered healthy by their parents. Amongst the 50 have been found 4 cases of "latent tuberculosis" (tuberculosis of childhood), 4 of enlarged glands of the tracheo-bronchial group, and 5 of non-tuberculous fibrosis, making a total of 13 cases in all.

2. The tuberculin test gave the following results: of 4 cases of tuberculosis of childhood 1 was ++, 2 were +, and 1 was negative; of 4 cases of enlarged glands, 2 were +, 1 was negative, and 1 was not done. It is concluded, so far as it can be from such a small number, that the tuberculin test is no guide in a sufficiently important group of cases. As no case of tuberculosis of childhood developed, so far as is known, from contact with an open case of tuberculosis, it seems that there is still a large amount of accidental tuberculosis abroad—what the French call "tuberculose de la rue." In an American series,[5] 91 per cent. of children with radiological lesions had no history of exposure.

3. The probable period of development and resolution in favourable cases of "latent" tuberculosis in children is about three months.

4. The shape and extent of the lesion, by radiography, is apparently no guide to its severity, nor any indication of its prognosis.

5. Clinical examination and the tuberculin test are not altogether reliable guides to the presence of "latent" tuberculosis in children.

(*References at foot of next page.*)

CHANGES IN THE LIVER OF MICE
FOLLOWING THE INGESTION OF HYDROCARBON OILS.

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AND
C. C. TWORT, M.D. ABERD.,
PATHOLOGIST TO THE COMMITTEE.

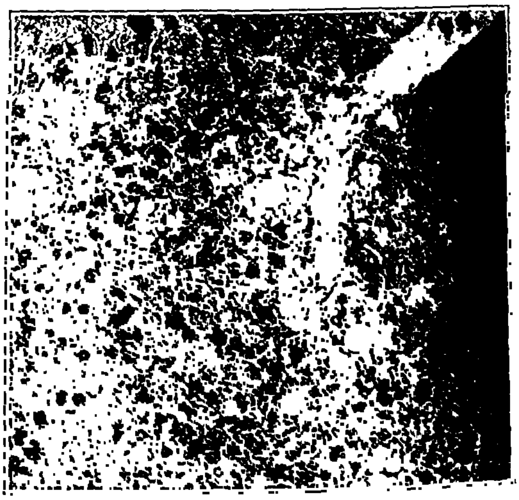
IN making an analysis of the results of many thousand post-mortem examinations of mice subjected to skin applications of various carcinogenic and non-carcinogenic agents we have been struck by certain microscopical changes which may at times be met with in the liver. We have, of course, encountered a great variety of diseases in the different organs of our animals, but the particular condition it is proposed to discuss is interesting in that it seems to be associated especially, although not solely, with mineral oil applications. The condition, hereafter called condition *x*, is depicted in the two accompanying microphotographs, which show the main features of the infiltrative process (Figs. 1 and 2).

The earliest indication seen microscopically that condition *x* may supervene is a periportal infiltration of small round cells with which may be intermixed a few polynuclears. Such an infiltration is very common in mice, and alone is of little significance for it precedes many other pathological changes in this animal. But we have noted that it seems to be always present to a greater or lesser degree in livers showing condition *x*. Later there appear, scattered throughout the organ as isolated members or in small groups, cells giving a definite but not intense bichromate reaction. They are easily distinguished from the round cells with which they may be intimately mixed. These cells vary in size, but are usually rather large, moderately well defined, with a reticular cytoplasm containing a central or eccentrically placed smallish, round or irregularly shaped nucleus staining densely with hæmatoxylin. They thus have the appearance of endothelial cells, and some of them are very similar to the characteristic cells found in xanthomas. In point of fact, however, we are at the present juncture not prepared to say anything definite as to their origin, except that they are seemingly not a product of the parenchyma cells but would appear to rise either from the capillary endothelium or from connective tissue; probably the former. The large cells increase in number, presumably in situ, forming conspicuous masses, but never large enough to be visible to the naked eye. Subsequently disintegration supervenes, this being first indicated by a foamy appearance of the cytoplasm, and later vacuolisation. Ultimately the cell is completely replaced by what is presumably a fat globule with the resulting microscopical picture of a type of fatty infiltration. There is unquestionably a certain amount of fat in the cell residue, but whether of saponifiable or hydrocarbon nature we cannot yet say. Investigations in this direction so far carried out do not exclude the possibility of hydrocarbon oils being associated with the animal fat which is present.

ORIGIN OF THE CONDITION.

Our attention was first drawn to this question on examining the livers of a batch of animals painted for a considerable period with a sulphur-treated shale oil, almost all of which showed condition *x* of the liver. We had previously met with the condition in many isolated specimens from animals treated with all sorts of agents, but although noted it was then looked upon as a chance fatty infiltration o little significance. As a result of our findings in th shale oil treated animals, we proceeded to examin the livers of animals treated for a similar perio of time with other agents, to try to find out whethe condition *x* was peculiar to shale oil treated animals The Table shows our findings in a few selected experiments, which will serve as examples of the kind o results to be expected.

FIG. 1.



Liver of mouse treated with Pennsylvanian spindle *oil*, showin typical infiltrative changes. (× 82.)

Substance applied.	Duration of exp. in weeks.	No. of animals.	Condition *x*.	Per cent
Diluted and acid treated shale oils	60	54	49	91
Refined shale oils	50	13	13	100
" " "	25	22	2	9
" " "	20	22	2	9
Shale oil residuum ..	50	16	1	6
Petroleum oil	60	49	38	77
" "	45	23	9	39
" "	40	125	40	32
Cotton-seed oil	50–90	25	0	0
Rape seed oil	50–70	7	0	0
Gas tar and synthetic tar..	40	30	0	0
[illegible]	25	68	0	0
[illegible]	45–60	321	154	48
[illegible]	40–80	130	0	0

The Table is almost self-explanatory. From ou preliminary observations it appears that gas tars synthetic tars, and saponifiable oils do not excit condition *x* of the liver. On the other hand an mineral *oil*, *disregarding* the degree of unsaturation seems capable of giving rise to the condition, provide

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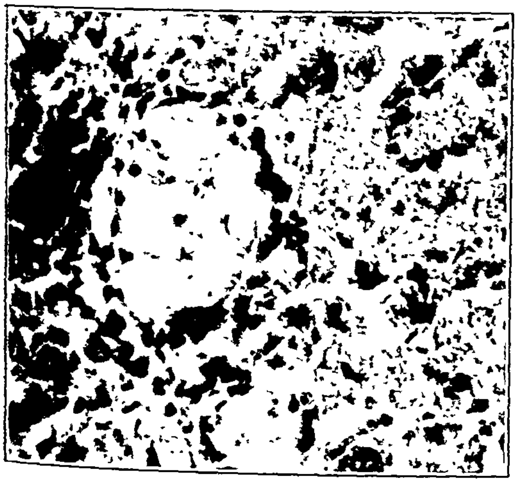
(*Continued from previous page.*)

DR. FLETCHER: REFERENCES.

1. Kerley, P.: Brit. Jour. Radiol., 1930, iii., 404.
2. McPhedran, F. M.: Univ. Penn. Rep., Henry Phipps Inst., 1929, xxi., 532.
3. Hetherington, H. W., McPhedran, F. M., Landis, H. R. M., and Opie, E. L.: Amer. Rev. Tuberc., 1929, xx., 413 and 421.
4. Mantoux, C.: Compt. rend. Acad. Sci., 1908, cxlvii., 355.
5. Barnard, M. W., Amberson, J. B., and Loew, M. F.: Amer. Rev. Tuberc., 1931, xxiii., 593.

survival is sufficiently long to give the oil a chance of acting. However, it is not improbable that the extent of the disease may bear some relation to the degree of unsaturation of the hydrocarbons responsible, shale oils being very active in this respect. If medicinal liquid paraffin is considered to be completely saturated, then unsaturation does not seem to be the essential cause at work, for condition *x* of the liver apparently results from contact of animals with white mineral oils. Synthetic tars diluted with liquid paraffin twice induced condition *x*, as did very frequently spindle oils of mineral origin rendered non-carcinogenic by treatment with large amounts of sulphuric acid, and from which almost all the unsaturated compounds were consequently destroyed or rendered saturated. Needless to say, further experiments with medicinal liquid paraffin are now being undertaken to investigate more thoroughly the effect of such oil on the liver. It will be noted that only one out of the sixteen animals examined which were painted with the residuum of shale oil showed the condition, and consequently it appears that the toxic substances concerned may be mostly confined to the lighter boiling fractions of the oils we utilised. Also we are inclined to believe that the crude oils and oil extracts are less likely to lead to condition *x* of the liver than the refined oils; and in view of the inactivity of tars the possibility of inhibitory substances has to be considered. We are not at all certain that oils from all fields are similarly active. These questions will need further investigation, especially in relation to other pathological conditions which may mask or otherwise interfere with the infiltrative process with which we are concerned.

FIG. 2.



Liver of mouse treated with medicinal liquid paraffin and 25 per cent. shale oil, showing earlier stage than Fig. 1, with degenerating foamy xanthoma cells. (× 500.)

The duration of time of exposure and the amount of oil which finds its way into the organism are bound to be important factors, but as will be seen from the Table we have found that, at least with shale oil, it does not require many weeks to elapse before evidence of condition *x* is forthcoming.

Our examinations thus provided ample evidence that some of the hydrocarbons constituting the mineral oils utilised by us, or that some specific constituents, were capable of inducing condition *x* in the liver of our animals, while the specific constituents did not appear to be present in gas tars, synthetic tars or saponifiable oils.

A few quite recently examined livers have, however, rather complicated matters, although at the same time they have served to throw some light on the probable nature of the chemical substances responsible. Thus the livers of 5 out of 15 animals painted with oleic acid heated at 330° C. for 72 hours showed condition *x*. We attributed this result to the synthesis of hydrocarbons on heating the acid, but subsequently the condition was found in two animals painted with untreated oleic acid. Furthermore, we have twice encountered condition *x* of the liver among 23 specimens from animals painted with a fraction of our synthetic tar obtained by treatment with ethyl oxalate, resulting in the extraction of compounds with a reactive methylene group. The results with oleic acid fit in quite well with those given by mineral oils in view of this acid's chemical relation to the olefines, but that the particular aromatic compounds in the tar should induce condition *x* puts an altogether different aspect on the subject. It must be understood that although we have in no instance encountered condition *x* of the liver in unpainted animals, it is not to be assumed that a similar finding will not be met with among such animals. It must also be emphasised that our tar experiments are relatively of short duration, and it is very probable that animals painted over a longer period of time would provide specimens of condition *x* of the liver.

OTHER ORGANS AFFECTED.

We have mentioned the liver as if it were the sole organ affected, but we have occasionally seen in the spleen, suprarenal glands and ovary a condition which bears a good deal of resemblance to condition *x* of the liver. It is probable that the chemical substance responsible for this particular pathological change gains access to the internal organs by way of the alimentary tract and not by direct absorption by the skin. We have no very exact experimental data to bring forward in support of this assertion, but that the animals ingest much of the material painted on the skin is beyond dispute.

In connexion with these observations on the mouse, there are two papers which must be referred to. One is by C. J. Polson[1] on experimental liver necrosis induced by shale oil, and the second by H. J. Channon and G. A. Collinson[2] on the increase of non-saponifiable fats in the liver of rats and pigs fed on a synthetic diet containing medicinal liquid paraffin.

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[1] Jour. Path. and Bact., 1931, xxxiv., 1.
[2] Biochem. Jour., 1929, xxiii., 676.

TRAINING OF SOCIAL WORKERS IN MENTAL HEALTH. A course in mental health is being arranged at the London School of Economics and Political Science to meet the needs of social workers whose services demand a more specialised knowledge of the causes and treatment of psychological difficulties than has hitherto been available in the general training in social science. The course lasts one year and includes both theoretical and practical training. Suitable candidates are admitted by a selection committee, preference being given to men and women who are over the age of 23, who hold a University certificate in social science, and have been engaged in social work. Consideration will be given to others with experience of responsible social work who, while they hold no University qualification, have reached a high standard of general education. With the help of the Commonwealth Fund of America the school is offering six scholarships to meet the expenses of students during training.

CLINICAL AND LABORATORY NOTES

ARTIFICIAL PNEUMOTHORAX.

TWO HUNDRED CASES.

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THE following figures summarise the results of cases of pulmonary tuberculosis treated by artificial pneumothorax at Winsley Sanatorium during the past seven years. These results are from selected cases where an artificial pneumothorax was employed after failure of routine sanatorium treatment to effect improvement, and deal mainly with cases of moderately advanced disease. They will not, therefore, be entirely comparable with American and Continental figures, for in Canada, America, and on the Continent many more early cases are subject to collapse therapy.

Artificial Pneumothorax Attempted in 200 Cases.

	Successful induction.	Failed to induce.	Total.
Alive	94 (57 %)	12 (38 %)	106 (53 %)
Dead	72 (43 %)	22 (62 %)	94 (47 %)
	166 (83 %)	34 (17 %)	

Class.	Gain or loss in weight.*	Alive.
Of 200 cases in which A.P. was induced—		
7 were in Class 1	Gained weight 47 % ; of these	77 %
53 ,, ,, 2	Lost weight 50 % ; of these	21 %
40 ,, ,, 3	Remained stationary 3 %	

* These figures are based on admission and discharge figures, the average duration of residence in hospital being 6¼ months.

Sputum. Before induction—
87 % of the patients were T.B. +
13 % ,, ,, ,, T.B. – or had no sputum.
On discharge—
54 % were T.B. + ; of whom 33 % are alive.
46 % ,, T.B. – or had no sputum ; of whom 65 % are alive.

Period since induction.	Nos. attempted, S = Successful; F = Failed.		Number. alive.	Per cent. alive.	Number dead.	Per cent. dead.
Under 6 mths. ..	22	S 17	15 + 1*	94	1*	6
		F 5	5	100	—	—
6 to 12 mths.	25	S 19	13 + 1*	74	4* + 1	26
		F 6	5	83	1	17
12 to 18 mths. ..	20	S 17	13 + 1*	82	2* + 1	18
		F 3	—	—	3	100
18 mths. to 2 yrs. ..	32	S 24	18 + 2*	83	4*	17
		F 8	2	25	6	75
2 to 3 yrs...	35	S 29	10 + 3*	45	12* + 4	55
		F 6	1	17	5	83
3 to 4 yrs...	36	S 31	9	29	15* + 7	71
		F 5	—	—	5	100
4 to 6 yrs...	24	S 23	7	30	10* + 6	70
		F 1	—	—	1	100
6 to 7 yrs...	6	S 5	1	20	3* + 1	83
		F 1	—	—	1	100
Total ..	200					

* In cases so marked the treatment by refills had to be discontinued. (*a*) In those alive, because of adhesions causing failure to produce satisfactory collapse. (*b*) In those who died, owing to deterioration of condition.

A certain section of the profession is still sceptical about the value of the treatment, but even if in some cases the results are not permanent yet, to use the words of the late Dr. Clive Riviere, the prolongation of life, increased comfort and wellbeing, and return of power to work—and this for the most part among cases of advanced disease—entitle the operation of pneumothorax to a very high place among successful therapeutic measures.

RAPIDLY ADVANCING TETANUS SUCCESSFULLY TREATED WITH SERUM.

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AUTHORITIES are by no means unanimous as to the
value of anti-tetanus serum in the treatment o
tetanus after the disease has clearly declared itsel
whereas the experience gained during the Great Wa
showed conclusively that as a prophylactic agains
tetanus the injection of antitetanic serum was ofte
of considerable value. Sir David Bruce[1] in a
analysis of 1000 cases of tetanus concluded tha
prophylactic inoculation of potential cases certainl
reduced the number of cases in which actual sympto
developed, prolonged the incubation period, an
diminished the rate of mortality in those in who
symptoms did develop. It has long been recognise
that the shorter the incubation period the high
is the mortality-rate, and in the cases analysed
Bruce the mortality-rate was 63·4 per cent. in cas
in which the incubation period was seven days
less, and 54 per cent. in which the incubation peri
was eight to fourteen days. Golla, criticising the
results, expressed the opinion that Bruce's figu
showed that the question of dosage did not h
at all in determining if serum had any therapeu
effect, while C. H. Browning said that Bruce's a
Golla's figures would seem to show the almost ut
uselessness of anti-tetanus serum as a therapeu
agent. This gloomy view was not supported, howe
by Sherrington's[2] observations of experimen
tetanus in monkeys, in which the best results w
obtained by introducing the serum subdur
by the lumbar or bulbar intrathecal routes.

CASE RECORD.

The following case presents several features
interest.

The patient, a boy aged 10 years, fell on a gravel
on June 9th, 1931, and injured his knee. Dr. A. E. Camp
of Guildford, attended to the injury, and at once cle
up the wound with iodine, and inserted one suture.
however, was removed next day because the wound
then suppurating. Dr. Campbell and his partner,
Arthur Mitchell, discussed the question of giving
tetanus serum and decided against it because the boy
fallen on a gravel path, which was unlikely to be inf
with tetanus. A few days later Mr. E. W. Sheaf, of Guild
saw the patient with Dr. Mitchell and discussed the ad
bility of opening up the wound, the question of anti-tet
serum being again discussed and the measure de
against. The temperature, which had never been hi
than 101° F., settled down, but began to rise agai
June 24th, when stiffness of the jaw was first not
Within an hour an injection of 13,000 units of anti-tet
serum was given intramuscularly. The wound was
examined on the 24th and a small sinus which cont
pus was laid open. Dr. R. C. Matson, pathologist t
Royal Surrey County Hospital, examined the disc
from the wound, but failed to find any evidence of te
in smears or by culture. At 10 A.M. on June 25th a se
dose of serum (20,000 units) was given intramuscu
and the boy appeared well, except that he took long
his breakfast owing to the stiffness of the jaws.

Dr. Eric Pritchard and I saw the boy shortly b
4 P.M. on that day, when trismus, opisthotonos,
risus sardonicus were well marked, while painful sp
of the abdominal muscles recurred at frequent short inter
These alarming symptoms had all come on rapidly
2 P.M. on that afternoon, possibly as the result of op
up the wound—which in the circumstances may
seemed desirable—and thereby liberating toxins into
system while there was little antitoxin present to neut

these. We decided not to examine him any further but to initiate serum treatment forthwith.

Under a general anæsthetic 20 c.cm. of perfectly clear cerebro-spinal fluid was withdrawn and 40.000 units of antitoxin in 13 c.cm. serum (B. W. & Co.) injected intrathecally. At the same time 40,000 units were injected intravenously and 40,000 units intramuscularly. Owing to the rapidity with which the symptoms had advanced that day, a very grave prognosis was given by Dr. Pritchard and the other medical men in attendance. At 5.30 P.M. chloretone, grs. 15, was given by rectum and at 7.45 P.M., as the opisthotonos and abdominal rigidity recurred, a further grs. 10 were given again by rectum. At 8.20 P.M. the patient was very collapsed and 0·2 g. of camphor in olive oil was injected subcutaneously. The wound was syringed hourly with eusol. The temperature rose to 102° F. at 10 P.M. but the patient passed a fair night. At 12.30 A.M., as the muscular spasms were frequent and severe, Dr. Mitchell and his partner, Dr. H. Bell, decided to give a subcutaneous injection of 20 c.cm. of a 25 per cent. solution of magnesium sulphate, and Dr. Bell, who remained with the patient for some hours to watch the effect, states that the spasms and muscular rigidity were definitely relieved by the injection.

On the morning of June 26th the boy complained of pain at the back of his neck, and in the eyes and abdomen, but the spasms were at longer intervals than on the previous day. At 12.30 P.M., under a general anæsthetic, lumbar puncture was again performed, the fluid spurting out under considerable pressure; about 30 c.cm. of turbid fluid was removed for subsequent examination, and 40.000 units of anti-tetanus serum in 13 c.cm. were given intrathecally and 60,000 units intramuscularly. Four rectal injections, each of chloretone grs. 10, were given during the ensuing 24 hours on account of restlessness or abdominal rigidity.

On June 27th I was unable to visit the patient and my colleague, Dr. A. Gordon Signy, kindly deputised for me. He reported that the rigidity had greatly diminished and there was no spasm of the jaw, but the abdomen was still boat-shaped. About 30 c.cm. of turbid cerebro-spinal fluid was again drawn off under pressure and 40,000 units of antitoxin in 13 c.cm. of serum diluted with 10 c.cm. of saline were injected intrathecally: at the same time 60.000 units were given intramuscularly. The patient was now obviously responding to the treatment, and on June 28th he was given 60,000 units intramuscularly by Dr. Mitchell; irritability and restlessness were treated with chloretone, grs. 5, when required.

On June 29th he was still rather irritable and complained of headache, so lumbar puncture was again performed. This time the fluid was not under pressure and was clearer than it had been; 25 c.cm. were removed and 20,000 units in 6·5 c.cm. +10 c.cm. of saline were injected intrathecally, and 60,000 units intramuscularly. The patient was now eating and sleeping better and was definitely brighter than he had been. On June 30th and July 1st and 2nd he had 40,000 units each day intramuscularly and 20,000 units on the 3rd. As he was now apparently convalescent and there were no more tetanic spasms, the chloretone and serum were discontinued. On the morning of July 1st, just a week after the first dose (4 c.cm.) of serum was injected and when a total of 173 c.cm of serum had been given by the three routes (13 c.cm. intravenously, 45·5 c.cm. intrathecally, and 114·5 c.cm. intramuscularly), the patient was very restless and complained of irritation of the back and legs, and during the day a papulo-erythematous rash appeared on the lower part of the back and on the face. The rash and irritation of the skin persisted until July 3rd, when contramine, 0·125 g. in 2 c.cm. of saline, was injected intramuscularly *twice*.

The irritation was finally overcome by the injection of 1 c.cm. of adrenalin solution (July 5th). The patient complained of pain in the left shoulder and the back of the neck for a few days (July 6th, 7th, and 8th), and of headache, but these were easily controlled by aspirin and bromides. Apart from a slight epistaxis on July 11th and 12th, the patient had an uneventful convalescence, and at no time were the joints affected. Except on one occasion—on the evening of the day that the serum was given by all three routes, when the temperature rose to 102·2° F.—the temperature never exceeded 101° F. even when the serum rash came out. There was never any difficulty with the passage of the urine, but the bowels were often difficult to move.

THE CEREBRO-SPINAL FLUID.

As is usual in tetanus, the first specimen of cerebro-spinal fluid examined was clear and normal in all respects. On June 26th, about 20 hours after the intrathecal injection of serum, the fluid which was obtained under pressure was turbid and gave a purulent sediment on centrifuging; it obviously contained several thousands of cells per c.mm.—almost all polymorphs. The albumin was 0·14 per cent. (it had been 0·02 per cent. the day before), there was good reduction of Fehling's solution, and no organisms were seen in films or obtained by culture. There was obviously a marked meningeal reaction to the injected serum but no true bacterial meningitis. On June 27th, after the second injection, the fluid was less turbid, and the cells numbered 3400 per c.mm. with 98 per cent. of polymorphs, protein 0·04 per cent., good reduction of Fehling's solution, and chlorides 7·0 g. per litre. No organisms were found in films or cultures. On June 29th the fluid was not under pressure and was clearer. The protein was 0·04 per cent., sugar was present, chlorides 7·2 g. per litre, and cells 165 per c.mm. (65 polymorphs and 100 mononuclears).

DISCUSSION.

Although it is impossible to conclude from an isolated case that antitoxin is of value in the treatment of tetanus, it was the unanimous opinion of all who saw this boy that at the time the serum treatment was begun the symptoms were advancing with alarming rapidity and that the serum appeared to check this advance and to promote recovery. Between June 24th and July 3rd no less than 633.000 units of tetanus antitoxin (B. W. and Co.) in 205·5 c.cm. of serum were administered; 40,000 units (in 13 c.cm. serum) on one occasion intra venously; 140,000 units (in 45·5 c.cm. serum) in four intrathecal injections; and 453,000 units in eleven intramuscular injections. Most authorities advise against intravenous injections of the serum on account of the risk of anaphylaxis. The Tetanus Committee of the War Office stated that the intravenous route is the most rapid method of neutralising the toxin, but dangerous on account of anaphylactic shock and "only to be recommended where the intrathecal route was impossible." In a disease like tetanus, where early and thorough treatment is of vital importance to the patient, it is permissible to take a certain risk, and in this particular instance the symptoms advanced so rapidly that the intravenous route was decided upon as being urgently necessary.

Should time permit it is advisable to give a small trial dose—e.g., 1 c.cm. of a 1/10 dilution of the serum intravenously—before giving the full dose of undiluted serum. J. W. West[3] stresses the importance of an intravenous injection of serum, in addition to the intrathecal and intramuscular injections, mentioning at the same time the danger of anaphylactic shock. He also states that the dosage should be as large as possible. Subsequent writers, such as Romanis and Mitchiner,[4] Carnegie Dickson,[5] Da Costa,[6] and Worster-Drought[7] are all against the use of serum intravenously.

The intrathecal injection of serum on several days is of the greatest value in the treatment. The meningeal reaction to the serum, the so-called "aseptic meningitis," is well shown in this as in most cases by the records of the cerebro-spinal fluid examinations, and although at first sight the turbid fluid may give the impression that a true meningitis was present, the presence of sugar in the fluid, the maintenance of the percentage of chlorides, and the absence of organisms in films and cultures all go to prove that such is not the case.

The effect of the injections of contramine in combating the symptoms of serum sickness was striking, and the use of the drug for this purpose is to be strongly recommended.

It is possible that the reason why anti-tetanus serum has not in the past been found of much value in the treatment of frank tetanus is that the dosage has been inadequate. Now that a very potent serum is commercially available, it is possible to give a patient a large number of units of antitoxin

(Continued at foot of next page.)

CLINICAL AND LABORATORY NOTES

ARTIFICIAL PNEUMOTHORAX.

TWO HUNDRED CASES.

BY JAMES D. MACFIE, M.B., CH.B. GLASG.,
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AND
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THE following figures summarise the results of cases of pulmonary tuberculosis treated by artificial pneumothorax at Winsley Sanatorium during the past seven years. These results are from selected cases where an artificial pneumothorax was employed after failure of routine sanatorium treatment to effect improvement, and deal mainly with cases of moderately advanced disease. They will not, therefore, be entirely comparable with American and Continental figures, for in Canada, America, and on the Continent many more early cases are subject to collapse therapy.

Artificial Pneumothorax Attempted in 200 Cases.

	Successful induction.	Failed to induce.	Total.
Alive	94 (57 %)	12 (38 %)	106 (53 %)
Dead	72 (43 %)	22 (62 %)	94 (47 %)
	166 (83 %)	34 (17 %)	

Class.	Gain or loss in weight.*	Alive.
Of 200 cases in which A.P. was induced—		
7 were in Class 1	Gained weight 47 %; of these	77 %
53 ,, ,, 2	Lost weight 50 %; of these	21 %
40 ,, ,, 3	Remained stationary 3 %	

* These figures are based on admission and discharge figures, the average duration of residence in hospital being 6½ months.

Sputum. Before induction—
87 % of the patients were T.B. +
13 % ,, ,, ,, T.B. – or had no sputum.
On discharge—
54 % were T.B. + ; of whom 33 % are alive.
46 % ,, T.B. – or had no sputum; of whom 65 % are alive.

Period since induction.	Nos. attempted, S = Successful; F = Failed.		Number. alive.	Per cent. alive.	Number dead.	Per cent. dead.
Under 6 mths. ..	22	S 17	15 + 1*	94	1*	6
		F 5	5	100	—	—
6 to 12 mths.	25	S 19	13 + 1*	74	4* + 1	26
		F 6	5	83	1	17
12 to 18 mths. ..	20	S 17	13 + 1*	82	2* + 1	18
		F 3	—	—	3	100
18 mths. to 2 yrs. ..	32	S 24	18 + 2*	83	4*	17
		F 8	2	25	6	75
2 to 3 yrs...	35	S 29	10 + 3*	45	12* + 4	55
		F 6	1	17	5	83
3 to 4 yrs...	36	S 31	9	29	15* + 7	71
		F 5	—	—	5	100
4 to 6 yrs...	24	S 23	7	30	10* + 6	70
		F 1	—	—	1	100
6 to 7 yrs...	6	S 5	1	20	3* + 1	83
		F 1	—	—	1	100
Total ..	200					

* In cases so marked the treatment by refills had to be discontinued. (*a*) In those alive, because of adhesions causing failure to produce satisfactory collapse. (*b*) In those who died, owing to deterioration of condition.

A certain section of the profession is still sceptical about the value of the treatment, but even if in some cases the results are not permanent yet, to use the words of the late Dr. Clive Riviere, the prolongation of life, increased comfort and wellbeing, and return of power to work—and this for the most part among cases of advanced disease—entitle the operation of pneumothorax to a very high place among successful therapeutic measures.

RAPIDLY ADVANCING TETANUS SUCCESSFULLY TREATED WITH SERUM.

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DIRECTOR OF THE PATHOLOGICAL DEPARTMENT, HOSPITAL FOR SICK CHILDREN, GREAT ORMOND-STREET, LONDON.

AUTHORITIES are by no means unanimous as to th value of anti-tetanus serum in the treatment o tetanus after the disease has clearly declared itsel whereas the experience gained during the Great Wa showed conclusively that as a prophylactic agains tetanus the injection of antitetanic serum was ofte of considerable value. Sir David Bruce[1] in a analysis of 1000 cases of tetanus concluded th prophylactic inoculation of potential cases certain reduced the number of cases in which actual sympto developed, prolonged the incubation period, a diminished the rate of mortality in those in who symptoms did develop. It has long been recognis that the shorter the incubation period the hig is the mortality-rate, and in the cases analysed Bruce the mortality-rate was 63·4 per cent. in ca in which the incubation period was seven days less, and 54 per cent. in which the incubation per was eight to fourteen days. Golla, criticising th results, expressed the opinion that Bruce's figu showed that the question of dosage did not h at all in determining if serum had any therape effect, while C. H. Browning said that Bruce's Golla's figures would seem to show the almost u uselessness of anti-tetanus serum as a therape agent. This gloomy view was not supported, howe by Sherrington's[2] observations of experime tetanus in monkeys, in which the best results obtained by introducing the serum subdur by the lumbar or bulbar intrathecal routes.

CASE RECORD.

The following case presents several feature interest.

The patient, a boy aged 10 years, fell on a gravel on June 9th, 1931, and injured his knee. Dr. A. E. Cam of Guildford, attended to the injury, and at once cle up the wound with iodine, and inserted one suture. however, was removed next day because the wound then suppurating. Dr. Campbell and his partner, Arthur Mitchell, discussed the question of giving tetanus serum and decided against it because the boy fallen on a gravel path, which was unlikely to be inf with tetanus. A few days later Mr. E. W. Sheaf, of Guild saw the patient with Dr. Mitchell and discussed the ad bility of opening up the wound, the question of anti-te serum being again discussed and the measure de against. The temperature, which had never been h than 101° F., settled down, but began to rise aga June 24th, when stiffness of the jaw was first no Within an hour an injection of 13,000 units of anti-te serum was given intramuscularly. The wound was examined on the 24th and a small sinus which cont pus was laid open. Dr. R. C. Matson, pathologist t Royal Surrey County Hospital, examined the disc from the wound, but failed to find any evidence of te in smears or by culture. At 10 A.M. on June 25th a se dose of serum (20,000 units) was given intramusc and the boy appeared well, except that he took long his breakfast owing to the stiffness of the jaws.

Dr. Eric Pritchard and I saw the boy shortly 4 P.M. on that day, when trismus, opisthotonos, risus sardonicus were well marked, while painful sp of the abdominal muscles recurred at frequent short inte These alarming symptoms had all come on rapidly 2 P.M. on that afternoon, possibly as the result of op up the wound—which in the circumstances may seemed desirable—and thereby liberating toxins int system while there was little antitoxin present to neut although it was not a matter for grave regret if a patient with G.P.I. succumbed to treatment, the doctor felt differently about a patient suffering from gonorrhœa which seldom had a fatal termination when untreated.

The use of strong antiseptics on the vagina such as lysol, alum, and copper sulphate, might lead to a chemical vaginitis; the vagina was almost completely insensitive, or such strong preparations could never have been used. He employed diathermy in chronic gonorrhœa with arthritis, but where there was a secondary infection in the cervix he believed that better results were to be obtained by ionisation. Where the cervix was torn, severely infected, and eroded excision might be necessary; the danger of sterilising the patient need not be considered for she was usually sterile already. A pessimistic view used to be taken of gonorrhœa in the female, but nowadays, if the patient was treated early, he believed that she could be cured nearly as quickly as the male.

ACTION OF REMEDIES.

Dr. T. **ANWYL-DAVIES** said that experiments had been carried out to decide how deeply silver nitrate and picric acid solutions penetrated the cervical mucosa; it had been found that neither penetrated to a distance of more than one-sixteenth of an inch, and that they led to the formation of a tough plaque on the surface which impeded drainage. Although it was accepted that the cervix and urethra should be treated in gonorrhœa, the uterus was usually omitted. He felt sure that in a number of cases the uterine wall was infected. This explained the boggy, tender condition of the uterus so often found on bimanual examination. The organisms were too deeply embedded to be dislodged by menstruation or curettage. Although the gonococcus was easily killed in vitro at 106° F., a temperature of 112°–114° F. in the cervical canal, produced by diathermy, failed to kill the organisms, even when applied for 30 to 40 minutes twice weekly, for a period of 8 to 12 weeks; indeed, the immunity of some patients appeared to be lowered by the treatment. He believed this to be because the high local temperature was only superficial, and that a little deeper in the tissues, the optimum temperature for the incubation of gonococci was produced.

In an acute first attack of gonorrhœa the patient took between two and three weeks to develop antibodies, but in a second attack antibodies were produced within a week; this indicated that it should be possible to stimulate antibody formation if the right antigen could be found, but gonococcal vaccines, so far, had not been successful. He looked upon the complement-fixation test as analogous to the Wassermann reaction; if it was positive it indicated a gonococcal focus somewhere in the body. He regarded it also as a test of cure; if a patient in whom the test was positive was placed under treatment there came a stage, usually about six weeks later, at which the test became negative; this indicated that the gonococci had been eradicated. In his opinion protein shock lowered the resistance of the patient. The results of protein shock in gonococcal arthritis might be spectacular but he preferred to relinquish them in favour of treatment with simple antipyretics, because he knew that the ultimate cure of the patient would be retarded by shock therapy. Malaria gave a mortality of about 10 per cent. and he did not care to use this method of treatment in gonorrhœa. At the London Hospital the Wassermann reaction, the complement-fixation test, and the Kahn test were performed for each new patient, and cervical and urethral smears and cultures examined. Treatment consisted of irrigation with sodium bicarbonate, and afterwards with chloramine T. and salt; a gauze drain soaked in glycerin was then inserted into the cervix, and the vagina was packed with glycerin gauze. Patients attended daily for treatment, and came readily. After three weeks the discharge had usually disappeared and the patient felt well. At the end of each month of treatment all the preliminary tests were repeated, and when these were all normal and the complement-fixation test negative, dismissal was considered. It was impossible to distinguish clinically between a vaginal discharge due to the gonococcus and a discharge due to other organisms; laboratory confirmation was all-important. Among 200 consecutive cases, 102 had been gonococcal. Erosion had been slightly commoner in non-gonococcal than in gonococcal cases. The complement-fixation test had been positive at the first attendance in 60 of the gonorrhœal cases and negative in 42, but many of them were acute cases, and the test might take up to three weeks to become positive. In 200 consecutive cases of gonorrhœa, the gonococcus had been present in smears and cultures in 120, in smears only in 20, and in cultures only in 60. For the treatment of gonorrhœa some solution was wanted which would kill the gonococcus by autolysis, in the same way that the pneumococcus was autolysed by an intracellular enzyme. It had been found that the action of the intracellular enzyme on the pneumococcus was enhanced by sodium desoxycholate, and he had recently been employing this drug as a local application in strengths up to 1 in 200. It appeared to be effective in the early acute stage, but later glycerin drainage was more valuable.

DISCUSSION.

Dr. **LYNETTE HEMMANT** agreed that the aim must be to differentiate between acute and chronic gonorrhœa and vaginal discharges due to other causes. Laboratory tests were essential. With late, vague cases the problem was to decide whether they were the end-products of chronic gonorrhœa, and if so, whether they were still infective; and if they were not gonorrhœal, whether they should be sent elsewhere for treatment. I. N. O. Price in 1929 had described a method of recognising gonococcal colonies after 24 hours' culture; this depended on an oxidase reaction, a pink colour developing when the reagent was added. Dr. Hemmant believed that the complement-fixation test was a valuable indication of progress, waning as the case improved. She preferred to use 10 per cent. mercurochrome alternating with mercurochrome in glycerin or 2 per cent. acroflavine in glycerin. It was important to reassure and encourage patients, many of whom were despondent of cure at the outset.

Mr. **DAVID LEES** said that if the clinical picture and laboratory tests were negative it should not be assumed that gonorrhœa was absent; the examination and tests should be repeated at a time when the patient had not douched or emptied her bladder for some hours. Patients with vaginal discharge fell into three groups: those in whom the diagnosis, clinically and bacteriologically, was gonorrhœa; those in whom the clinical picture and the history suggested gonorrhœa, but who gave negative laboratory tests; those in whom there was no evidence of infection by the gonococcus, but in whom there was evidence of infection by other organisms. Patients in the third group should be sent elsewhere for treatment as it was unfair to let them bear the stigma

MEDICAL SOCIETIES

ROYAL SOCIETY OF MEDICINE.

SECTION OF OBSTETRICS AND GYNÆCOLOGY.

A MEETING of this section on Feb. 19th, with Mr. VICTOR BONNEY, the President, in the chair, was devoted to a discussion on

Gonorrhœa and Other Cervical Discharges.

Colonel L. W. HARRISON said that at most clinics all vaginal discharges were treated on the same lines as gonorrhœa, and no attempt was made to differentiate between them. Some attempt to make a definite diagnosis in order that treatment might be directly purposeful would be better. By means of microscopical and cultural investigation, and by the use of the complement-fixation test a definite decision could be reached. In many of his own cases, he was convinced, the gonococcus would have been missed if cultural tests had not been employed; the complement-fixation test was also valuable and gave some indication of progress. It should be possible to decide quickly whether a discharge was due to the gonococcus, to bacteria other than the gonococcus, or to chemical irritation. Cases due to chemical irritation, where douching had been employed for years, often cleared up rapidly when treated with a masterly inactivity. In cases due to bacteria other than the gonococcus the organisms were superficial and accessible, and a properly directed frontal attack sufficed to cure the condition. He was confident that a large number of vaginal discharges were wrongly diagnosed as gonococcal in origin. The use of strong antiseptic solutions for such cases only destroyed the mucous membrane and made it susceptible of invasion. The preparation chosen should be that which did least damage to the tissues when applied in a strength sufficient to destroy the organisms. He preferred to use mercurochrome in a 10 per cent. solution; this was applied to the cervix on a swab which was left in place, or changed once or twice, while the vagina was painted with the same solution. Vaginal douches alone were useless in cases where the infection was situated in the cervix.

In gonorrhœa the infection was intra- and periglandular, and a frontal attack was less likely to be successful; reliance must mainly be placed on exploiting the patients' powers of resistance. Local treatment could only neutralise the toxins and promote drainage, and if pushed too far might weaken the resistance of the tissues. Although vaccines might appear to be ineffectual if used blindly, there were a number of cases in which the gonococcus had persisted for months in spite of treatment, and where the complement-fixation test was negative or mildly positive; in these the use of a vaccine was nearly always followed by a rise in the titre of the complement-fixation reaction and the disappearance of the gonococci. In some of these cases a small dose of vaccine produced a vigorous general and focal response, and in others large doses were tolerated with little effect. He urged the importance of a wider use of vaccines in the treatment of chronic gonorrhœa. Where the use of a vaccine was found to raise the titre of the complement-fixation reaction, without an accompanying disapearance of the gonococci, glycerin drainage by the Remington Hobbs method was often useful.

INFECTION AND TREATMENT.

Mr. J. JOHNSTON ABRAHAM had attempted to decide in what proportion of cases the gonococcus could be isolated. Out of 1000 consecutive cases of vaginal discharge in adult women attending the London Lock Hospital, the gonococcus had been isolated in 411. In 437 the gonococcus was not found although the discharge was venereal in origin; the discharge was non-venereal in 152. It appeared to be more difficult to isolate the gonococcus in pregnant women. When the gonococcus was not present, cultural examination usually showed a variety of other organisms; the presence of a hæmolytic streptococcus in the cervix was a contraindication to induction or curettage. Secondary organisms tended to maintain the inflammation after the gonococcus had disappeared, and shock therapy might be useful in such cases.

It was difficult to decide on any criteria of cure. Two infallible tests could never be performed by the medical practitioner: one was the inoculation of the conjunctival sac of a baby with the discharge, and the other the inoculation of the male urethra. Nature however, performed these tests without compunction. Other tests were substitutes for these and included clinical evidence, the evidence of smears and cultures and the complement-fixation test. He did not consider that this test had any value as an indication of cure, because if the patient's antibody production was poor the test would be negative, while a vaccine could provoke a positive reaction even in a norma person. Moreover, in a patient with sealed tubes who was not contagious, the test would be positive As an indication of progress, however, the test was valuable.

Various intravenous injections, including salvarsan, mercurochrome, hexamine, and many others had been tried in the treatment of gonorrhœa he had experienced little success with intravenou remedies except S.U.P.36. Drugs by mouth had little effect; he shared Colonel Harrison's views on vaccines Pyrotherapy had recently been tried; this entailed raising the temperature of the patient to a point a which it was injurious to the gonococcus. Mill and T.A.B. injections and infection with malaria had all been employed. He deprecated the use of malarial infection in treating such patients

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(*Continued from previous page.*)

in a relatively small volume of serum, though doubtless in hospital practice the cost of the serum rather militates against its use. The prevalent fear of injecting the serum intravenously is also perhaps a contributory cause of the unsuccessful results of serum treatment.

I should like to thank Dr. Mitchell and Dr. Pritchard for giving me the opportunity to treat and report this case; also the other practitioners and the nurses whose care contributed to the successful issue.

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count must be watched, for the chief danger from the use of high-potential rays was the diminution of the red cells to the stage of anæmia. Eighteen years ago the treatment was by small doses of low potential, and some remarkably good results were secured. In one case, with whites over 700,000, the patient had to be carried into the room on a stretcher and was very dyspnœic. The treatment effected a reduction in the whites to 12,000 and the spleen returned to its normal size. To-day Dr. Russell Reynolds recommended 80-kilovolt doses filtered through 0·5 mm. of aluminium; he did not resort to higher potentials until this weaker dosage had definitely failed. In severe cases with abdominal enlargement it might be necessary to start with very small doses to avoid a dangerously acute reaction. The aim should be to obtain good results with slight penetration, the patient's own recuperative powers being kept at their best.

He had not had much experience in treating leukæmias with radium, but results seemed to be promising in a few cases where surface applications over Columbia paste had been used.

DISCUSSION.

Dr. F. HERNAMAN-JOHNSON said that occasionally an obstinate mastitis would clear up after some weeks of reaction following a somewhat high voltage application, other means having failed. In the treatment of leukæmia, his custom was to alternate X rays with ultra-violet light; this not only maintained the general health, but enabled the operator to keep his X ray dosage to the minimum.

Dr. J. H. WEBSTER said it was difficult to know which to accept of the authoritative definitions of mastitis given respectively by Mr. Sampson Handley and by Sir Lenthal Cheatle. Cases with pea-like nodules in one quadrant yielded well to X rays, though he preferred 60 kilovolts to 80. More intense mastitis with larger lumps must receive heavier doses and deeper therapy. He had obtained good results by this means in 87 per cent. of his cases. Some were later treated surgically by Mr. Sampson Handley, and some had continued pain, and finally the supervention of malignant disease. He advocated the cross-fire method where possible.

Dr. N. S. FINZI submitted that there were two distinct forms of mastitis: one a pure inflammation, the other a hyperplasia blocking the ducts. The first of these should be treated in the same way as any other inflammatory condition—i.e., with small doses of medium penetration. He used 130 kilovolts through 5 mm. of aluminium. He believed this stimulated and hastened the natural process of repair. In the other form, unless the condition was purely inflammatory, the epithelium of the ducts must be destroyed, and deep therapy was needed to ensure this. Drastic measures were required since these cases were liable to become malignant.

Dr. GILBERT SCOTT said that in the treatment of the leukæmias the chief care should be not to overdose the patient. The aim should not be to bring the white cells quite to the normal. He was convinced that each patient had his or her optimum, something between 10,000 and 12,000. By keeping down the dosage to the minimum the patient could be kept susceptible to the rays for a much longer time; in cases of relapse the rays seemed definitely less effective.

Dr. J. E. LYNHAM spoke of cases in which the breast resumed its normal size after irradiation but the pain persisted; this pain he regarded as neuralgic; it proved very stubborn. The late Dr. Robert Knox held that the effect of irradiation in blood diseases was largely on the cells in the blood stream; in susceptible cases treatment should not be pushed until the white cells were at or below normal, since the reduction would probably persist after cessation of the treatment. He thought that in course of time a scheme could be evolved by which the blood condition could be controlled during the administration of very small doses of rays. By overstepping the line in dosage it was possible to bring about a fatal result.

Dr. G. B. BATTEN said that in neuralgic congestion of breast great relief generally followed gentle rubbing towards the nipple with a mixture of equal parts of eau de Cologne and castor oil.

Recent Advances in the Treatment of Rheumatism and Asthma.

Dr. GILBERT SCOTT said that asthma and rheumatism were closely allied. It was common for a rheumatic patient to suffer from asthma and for the swelling of the joints to be a precursor of an attack of asthma. Most workers on asthma had concentrated on the thorax, but Polman, in America, had obtained improved results by irradiating the spleen. Dr. Scott believed that any benefit after treatment of the thorax was due to the accidental inclusion of the spleen in the irradiation. He was still using the method he advocated in 1926; he had devised an apparatus for the simultaneous treatment of front and back, with the object of destroying metastases from malignant foci, and a patient volunteered the information that he had cured her asthma at the same time. He covered the chest and genital organs with a layer of rubber during treatment, and used a medium wave length; full tolerance was attained when in 48 hours a feeling of slight nausea was produced. The suprarenal gland was an important factor, in his view.

Every clinic for the treatment of arthritis should, he said, have an efficient X ray department. Until knowledge concerning the best combination of wave length and filtration was more precise he did not think much progress could be expected in the treatment of rheumatic conditions. Hip-joint cases gave a quicker response to medium length rays, with aluminium filtration. By applying the rays in a certain direction a larger expanse of joint surface was reached than in any other direction. Kahlmeter claimed to have obtained good results from X rays in rheumatoid arthritis, but Dr. Scott doubted whether his patients were suffering from true rheumatoid arthritis. Such patients might get temporary relief from the rays, but they relapsed before very long. The speaker was now trying irradiation of the whole spine. The rheumatoid arthritic group showed bone changes which Dr. Scott regarded as of metabolic origin. The osteo-arthritic group of cases, if not of very long standing, were rendered symptom-free for some time. Gout he had treated only in the acute form by irradiation, which brought great relief. Cases of spondylitis deformans were among the major tragedies of medicine; patients afflicted between 20 and 30 years of age were old before they had had a chance of anything like a full life. In 90 per cent. of them infection was present, the sacro-iliac joint being usually the earliest affected. It might be wise to ask the orthopædic surgeon, in the early stage of the condition, to curette that joint. There was not much hope of cure if the condition had existed more than two years. In both active gout and acute gonorrhœa medium length X rays gave rapid relief.

of attending a venereal diseases department. The primary principles of treatment in gonorrhœa were physical and mental rest, and attention to general hygiene. If all acute cases could be admitted to hospital until after the next menstrual period the incidence of tubal infections, he believed, would be cut down by 75 per cent. In treating urethral infections he preferred to use permanganate of potash or albargin which promoted mild venous congestion and improved drainage. Strong antiseptics might do damage; for urethral treatment he would not use mercurochrome in a stronger solution than 2 per cent. For the cervix he used picric acid, and thought it extremely important, after swabbing, to dry the vagina with magnesium oxide or starch. Chronic cases he *treated by glycerin drainage and by* dilatation and cervical suction or urethral suction. He had obtained good results with electrargol in Bartholin infections; 1 to 2 c.cm. were left in the abscess cavity, but if this failed the gland could be excised. He had only found bacteriophage valuable in ophthalmia neonatorum, which usually cleared up after two applications. Diathermy he used as an adjunct, not a cure. Every case could be cured in time, and a reasonably optimistic attitude should be encouraged in the patient. If all tests were clear at the end of three months the patient might be given a provisional clean sheet. At the end of six months the *tests should be repeated after a provocative dose* of vaccine and the insertion of glycerin drains in the cervix and urethra. If the tests were still negative the cure might be regarded as established. In many pregnant cases it was impossible to demonstrate the gonococcus, but the patient should be treated even if the tests were negative, only mild antiseptics being used. It had been found that in the cases so treated the puerperia were less morbid than in clean cases.

Mr. D. H. MacLeod said that at the Middlesex Hospital it was found that one-fifth of the total number of patients ceased to attend before they were cured. The *average duration of treatment* in non-gonococcal cases discharged as cured was 12 months and in gonococcal cases 15 months. If, on the examination of a smear, no gonococci were found and the pus cells numbered less than 50 per cent. of the total cell count, a negative result was reported. He had obtained little success with vaccines.

Dr. J. C. Moir had used diathermy in 44 cases where the gonococcus had persisted in spite of previous local treatment. After six treatments 20 were clinically cured and gave three negative monthly smears. He believed that diathermy had no direct effect on the organisms, but acted merely by causing vascular dilatation and promoting drainage. In acute cases diathermy was useless and only aggravated the discharge. He referred to a condition in which there was a sudden appearance of an irritating discharge associated with vaginitis but no urethritis; the gonococcus was not found but the *Trichomonas vaginalis* was constantly reported and might be the causal organism.

Dr. D. Watson advocated the use of tubular sounds when exploring the cervix or urethra; there was less chance of pushing infected material into the uterus or bladder than with a solid instrument.

Dr. Muriel Keyes described the spectacular cure of a case of severe gonococcal arthritis by means of pelvic diathermy. The patient relapsed or was reinfected, and a second attack of arthritis was cured in the same way.

Miss D. C. Logan mentioned the use of alkalis in the treatment of discharge due to an acid secretion associated with the *ordinary group* organisms. She emphasised the value of glycerin drainage in gonorrhœa.

Colonel Harrison, in replying, said that antenatal *treatment of pregnant* women was important from the point of view of the obstetrician; the descent of the infant was analogous to the passage of a catheter through a dirty urethra, and he advised a thorough *local toilet of the patient at the* beginning of labour.

SECTION OF RADIOLOGY.

A meeting of this section was held on Feb. 19th, with Prof. J. M. Woodburn Morison, the President, in the chair.

Dr. Russell Reynolds opened a discussion on

X Ray Treatment of Mastitis and Certain Leukæmias.

He said he used the term "mastitis" in the same sense as did Mr. Sampson Handley in his Bradshaw lecture.[1] Several types of case presented themselves for treatment. In early chronic cases increased cellularity, and more acini than usual, were to be seen, while enlarged ducts formed irregular projections into the lumen. In more advanced cases the *elastic tissue of the smaller ducts* disappeared and the acini were surrounded by a wavy fibrous tissue, which came to a point at the nipple. The part of the breast most affected was the outer and upper quadrant. The condition might follow a preceding acute mastitis or trauma, or irritation caused by pressure of the clothes. These cases yielded readily to small doses of X rays at a low potential, 80 kilovolts. In a general way he ha found a suitable dosage *to be half an erythema* dos of unfiltered rays, three such doses at weekly interval usually sufficing. In most cases there was no retraction of the nipple, but patients complained of aching *and of a shooting pain in the* breast, sometime passing up the axilla. Tenderness might be acut and a soft axillary gland might be palpable. Durin the first few hours following the treatment increase fullness and discomfort occurred, but after 48 hou that had usually passed off, and in seven days th mastitis had definitely improved. After the secon and third dose the discomforts diminished. Som times it was well to delay subsequent doses if th *reaction had been pronounced. One type* of mastit was met with at the climacteric, both breasts bein equally affected. These cases did not respond s readily to treatment, and if the mild treatment di not succeed, two or three doses of shorter wav length should be substituted. In some chron cases cysts formed, these being due to dilatation the ducts in the lobules of the breast tissue, and i the cysts papillomata might occur. The induratio *disappeared before the cysts*, but these were oft dissolved by 130-kilovolt doses; they might nee deep X ray therapy. In his view mild X ray trea ment of mastitis might act as a prophylactic measu against a later development of carcinoma.

As to the treatment of leukæmias, Dr. Russe Reynolds said that the nature of leukæmia was n yet clear; but X rays and radium had a profoun effect on the condition, irradiation being, in fac the *most* effective weapon available. His lon experience had convinced him, however, that th treatment was no more than palliative; the bloo rather than to his words; Dr. Adler would agree with much that had been said. Dr. Young's assumption that people think that society is infallible was not a gospel to-day. When an individual antagonised society, and refused to coöperate, he was only expressing a decision to make his own terms or break with society. The underdog was not always a hero. Dr. Crichton-Miller did not agree that Dr. Adler stood for a static society, he did not deserve the metaphysical pounding he had just received.

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[1] The Lancet, 1931, ii., 1169.

Dr. C. I. Schiff remarked that the original basis of individual psychology was the question of inferiority not coöperation. Coöperation arose as a means of curing the inferiority. Adlerian psychology owed its birth to the influence of Nietzsche. A neurotic was a person who could not fit into any society.

Dr. T. Lawson doubted whether adaptation and coöperation were the same thing; Dr. Adler spoke more of adaptation. If parents understood their children, the children would be able to adapt with more courage.

Dr. Hilda Weber pointed out that the society to which Dr. Young had referred was rather vague and indefinite. Coöperation was to a greater extent concerned with something more tangible—i.e., real, living people; Dr. Adler's injunction, "to do something for somebody else" was appropriate here. Even those who retired from society, for instance the monks, coöperated very definitely with a well-defined society within the monastery walls. She referred to the bonds which united the members of the different schools of psychology.

Dr. F. Bodman said that the question of adaptation in connexion with the individual was largely one concerned with the milieu in which he lived.

Dr. J. D. Hessey thought that the previous speakers had taken too parochial a view of society. Adaptation to a section of people was one thing, and adaptation or coöperation with society as a whole another. He considered that the present chaotic condition of society could only be changed by integration of the individual according to the principles of individual psychology.

Dr. G. Gordon remarked that it is not always wise to deal with patients philosophically. Society had its rights.

Dr. M. Marcus said that every doctor should have his opinion as to what constitutes a good society, and what are the elements with which the individual should coöperate.

Dr. Bevan Brown held that the neurotic was one who did not *want* to coöperate. He should be freed from his conflict so that he could coöperate.

Dr. A. Sanderson said that Dr. Young had crystallised the difficulties which he himself had found, Adler seemed to plead for the world as it is.

Dr. Burnett Rae considered that the psychologist who is out to help must have an individual point of view; he must have something to give to the patient.

Dr. F. G. Crookshank contended that Dr. Young spoke more against words than content. It was a valuable destructive analysis of a false interpretation of coöperation. The neurotic was one who has no real social feeling. His purpose was aggrandisement rather than coöperation. It was not necessary to assume that change is always good. Adler pointed out that criminals do coöperate, hence the saying, "honour among thieves"; the criminal was a product of society. Adler did not suggest that the small group should necessarily agree with the larger. In urging coöperation he meant willingness to conform so far as was consistent with the good of the larger whole. Keats contributed to art, but he did not coöperate with others in life. Adler would probably say that the question to be considered is whether it is better to have a fairly uniform and happy society with fewer works of art.

REPLY.

Dr. J. Young said that he had not been tilting against Adler's spirit. He had been speaking of the philosophic background. It was necessary that this should be made conscious and be understood, otherwise every kind of malpractice might be allowed in the name of individual psychology. He considered that organ inferiority, emphasised by medical men, was inseparable from adaptation. He agreed that all the onus should not be put on to society; nevertheless the responsibility of parents was often insufficiently recognised. By society he meant the inertia of life, the drift of things.

LIVERPOOL MEDICAL INSTITUTION.

A meeting of this institution was held on Feb. 4th, with Prof. R. E. Kelly, the President, in the chair.

Antenatal Radiology.

Dr. R. E. Roberts read a paper based on the results of radiography in 550 cases, all of which presented some element of clinical doubt or difficulty. The method was useful, he showed, in estimating the exact degree of pelvic deformity and the position and size of the presenting part in relation to the normal pelvis. It was also of value in estimating the maturity of the fœtus at any time after the end of the fourth month—especially in cases where the clinical evidence was doubtful. Further, it gave important information not only about the presentation but also about the position of the fœtal limbs in relation to the trunk and head, and in cases of multiple pregnancy it demonstrated the relative positions of the fœtuses. Cases of extra-uterine pregnancy were difficult to diagnose unless some means could be adopted of more clearly visualising the position and size of the uterus. In deciding the cause of hydramnios, radiography was found to be invaluable; fœtal abnormalities were, as a rule, diagnosed with precision where their nature or even presence was uncertain from clinical examination.

Prof. W. Blair Bell said that he had coöperated with Dr. Roberts from the commencement of his work on antenatal radiological diagnosis and great benefits had accrued to his patients thereby. Yet he had found great difficulty in persuading some of his colleagues in other places that it was possible accurately to measure the pelvis, estimate the age of the fœtus, and so on. There were still those who were regarded as authorities on antenatal work, but did not yet recognise the fact that radiography was, in many cases, an essential part of antenatal investigation; the most they would admit was that this was a matter for further research! Estimations of the age of the fœtus and of the hardness of the skull were of great value, for postmaturity was not uncommon, and often led to difficult labour from disproportion if the head would not mould in the normal manner. On the evidence of a radiogram, induction could be practised in good time. Actual measurement of the head, which was difficult, was in reality not of any special value, for a slight degree of hydrocephalus was

The real value of X rays in rheumatism was not yet known, and careful observations of the results of various doses were needed. Sometimes obstinate cases yielded to a change of dosage. So large did cancer loom in the X ray departments of hospitals that less serious conditions took a secondary place. The idea that the maximum dose of rays would produce the maximum benefit was no more true than it was of drugs. He looked forward to the time when a sort of X ray pharmacopœia would be available so that the practitioner could readily ascertain what was the best dosage for a particular disease.

The PRESIDENT said that he had started treating asthma by X rays many years ago in Manchester. At first he treated the lungs, later the spleen, and finally he concluded that the result did not vary much with the part to which the rays were directed. The type of patient who derived benefit from X rays yielded also to ordinary protein shock methods. He agreed that the rays should not be applied to the chest in cases of asthma.

Dr. S. L. MUCKLOW said that in one group of asthma cases X rays cleared up the condition, and there was no recurrence for one to two years. In another group the patient remained free for nine months without recurrence, and subsequent attacks were reported to be milder. In a third kind of case recurrence took place three months after the temporary cure.

Dr. W. F. COKE said that the differentiation of those types of asthma which yielded good results when X rayed was urgently required. In his view the change brought about was a biochemical one.

Dr. WEBSTER remarked that other spasmodic conditions also benefited from X rays, especially pylorospasm and other gastro-intestinal states. When the whole body was treated it should not be by deep therapy.

Dr. HERNAMAN-JOHNSON said that the early medical treatment of Graves's disease should certainly include X rays, before the case was handed over to the surgeon. Small doses of X rays two or three times a week would often result in increase of weight and lowering of the pulse-rate.

MEDICAL SOCIETY OF INDIVIDUAL PSYCHOLOGY.

AT a meeting of the society, held on Feb. 11th, at 11, Chandos-street, with Dr. F. G. CROOKSHANK in the chair, Dr. J. C. YOUNG read a paper entitled

Individual Psychology and its Philosophical Implications.

Dr. Young indicated in outline the practical importance of a clear understanding of the philosophical implications of individual psychology. He then dealt in more detail with the theses as enunciated in a lecture, entitled "The Meaning of Life," in which Dr. Adler develops the view that the meaning of life is to be found in contribution and coöperation. Dr. Young criticised this conception on the grounds that, valuable as it is, it involves certain inherent contradictions which cannot be resolved in terms of individual psychology as at present formulated. The wide conception of "contribution"—Adler exemplifies this concept by work, children, ideas, and so on—requires qualification. Work may be good or bad, children healthy or sickly, ideas true or false—in other words a contribution may be positive or negative. The feature common to all positive contributions is their survival value. But even this position requires further consideration. Just as that which is useful at one period of life may later be outgrown, so the genuinely positive contribution may in time become negative. In addition the positive contribution in one order of life may be based upon a negative contribution in another. Some of the most painful cases of maladaptation occur in those whose positive contributions are infinitely greater than are some of those whose social adaptation is apparently complete. The poetical works of Keats are enduring, yet the man himself was not socially well adapted.

It was not sufficient therefore to say "adapt yourself to society"; such a formulation of social coöperation is inadequate and a danger. One must be certain of the intrinsic value of society before one is justified in urging the sacrifice which such adaptation involves. The point at issue was whether the society with which the individual should coöperate should be that of the past or of the future, that of the present being a flux between the two. The medical psychologist must have a clear conception of the order of society required to resolve the contradictions of patients of high potential value. Such a society must be living, dynamic, biological, not static and mechanical, otherwise there was danger that one might be pressing for coöperation with an obsolete society, for adaptation which is bad. There was a creative-destructive urge in life which constantly presses not only towards the creation o something new, but also towards the destruction o what is obsolete, so that the new may emerge Society as a living organism must be prepared fo creative convulsions similar to those which occu in the animal organism, for instance the mino convulsion of the moulting bird, or the majo convulsions of man at puberty. The increase i number and complexity of psychological problem suggested that a great social convulsion, initiated b the Great War, is now in progress. It was not merel the individual who has reached his capacity t coöperate; the onus must at times be shifted on t society. The doctor now dealt with psychologica difficulties formerly taken over by the priest. He migh not be able to offer to the psychologically recalc trant the consolations offered by religion, but h could point out that one way of coöperating with society of the future was by helping to bring about on which would be more completely coöperative. Ma must no longer be regarded dualistically as consistin of the natural and the supernatural, but as a dynami and organic whole. Not the "organic" of medica tradition, but one which was totally inclusive of th human being. Existing society must not be accepte as finality, a norm. Adler had said "the crimin will not coöperate." But to the extent that it doe not bow to the established order of things the rev lutionary spirit might be regarded in the same wa It was important therefore to distinguish betwee positive maladaptation and negative maladaptatio between the forward-looking "revolutionary" an the backward-looking "criminal." Inability t coöperate with existing society might denote capacit to coöperate with a future society which is deni expression by society as at present constituted.

DISCUSSION.

Dr. H. CRICHTON-MILLER said that there wer several fallacies underlying Dr. Young's thesis It was a good motto to speak to a man's meanin

REVIEWS AND NOTICES OF BOOKS

A Text-book of X Ray Therapeutics.

Fourth edition. By ROBERT KNOX, M.D., M.I.E.E., D.M.R.E. Completed and edited by WALTER M. LEVITT, M.B. Irel., M.R.C.P. Lond., D.M.R.E., Medical Officer in charge of the Radiotherapeutic Research Department and Assistant Medical Officer to the X Ray Department, St. Bartholomew's Hospital, London. London: A. and C. Black, Ltd. 1932. Pp. 250. 21s.

TWELVE years ago the late Dr. Knox published a volume on radiotherapeutics that covered the application of both X rays and radium to medicine. When he died in 1928 he had for some time been at work on a similar book which would deal only with X ray therapy. Dr. Levitt has taken up the tale where Dr. Knox left it. He had not had the opportunity of working with Dr. Knox and it was a bold step to take over his material, and, after four years during which X ray therapy has made feverish progress, to attempt to weave it into a connected whole. Dr. Levitt has justified his courage for he has produced a valuable work, and has, moreover, helped to perpetuate the memory of a pioneer who in the very earliest days strove to help radiotherapy out of the stage of empiricism and place it on a scientific plane. It is interesting to compare this volume with its predecessor, written at a time when dosage was entirely empiric. Extraordinary advances have taken place in the power of the apparatus available, in its reliability, and more especially in the measurement of the intensity of radiations at any required depth. A welcome appendix is a paper by Dr. Knox read just before his death at the Stockholm Congress, in which he discusses the biological factor as a guide to dosage and its influence upon developments of technique.

Dr. Levitt has succeeded in fusing his own material with that of Dr. Knox, and has contrived to make the book an almost continuous story. Of the many excellent chapters, we would particularly commend the balanced and judicious accounts of the effects of X rays on tissue. The chapters on physics, X ray measurement, and filters are admirable; it is perhaps unfortunate that the account of principles of X ray therapeutic technique does not follow these chapters directly, being separated from them by two chapters dealing with apparatus. The technique of the treatment of malignant disease in different regions is described in a simple, straightforward way, and where a variation of method is advised a satisfactory reason for it is usually supplied. It is interesting to compare these chapters with those in Dr. Knox's original book. The conclusion reached from such a comparison is that X ray therapy of deep-seated lesions has made great strides in the last twelve years, while the treatment of superficial lesions, if judged by this book alone, would appear to be at a standstill, for the chapters in the two books are, for the most part, identical.

This treatise will be a reliable guide to the experienced medical radiologist to whom alone X ray therapy should be entrusted. It will also serve as an indication to physicians and surgeons the present scope of X ray therapeutics. There seems to be little doubt that in the future this scope is likely to be enlarged, especially as a supplement to treatment with radium.

Annals of Roentgenology.

A Series of Monographic Atlases. Edited by JAMES T. CASE, M.D., Professor of Roentgenology, Northwestern University Medical College, Chicago. Vol. XIII. *Gynæcological Roentgenology.* By JULIUS JARCHO, M.D., F.A.C.S., Sydenham Hospital, New York. New York: Paul B. Hoeber, Inc. 1931. Pp. 571. $20.00.

THIS volume, devoted to gynæcological radiology, is almost entirely concerned with X ray diagnosis. The one chapter dealing with radiotherapy gives such a very brief survey of the subject that it is of little value to any but the most general reader.

In the first few chapters Dr. Jarcho gives a clear and detailed description of the technique for producing a pneumo-peritoneum designed to aid radiography of the pelvis. He points out the various uses that can be made of X rays in gynæcology, and goes on to enumerate the complications which may occur, and have occurred, during the production of pneumoperitoneum. Next he discusses the value of insufflation of the uterus and Fallopian tubes as a means of diagnosing the patency of the latter, and again draws attention to the possible dangers if too great a pressure is used. As an alternative, the method of injecting iodised oil through the uterus and tubes is discussed at length, and very precise details are given of the technique. The author himself uses and recommends a combination of induced pneumoperitoneum and utero-salpingography, which he believes gives a clearer picture of any abnormalities that may be present than either method alone. He quotes some cases in which dysmenorrhœa seemed to be cured by insufflation of the tubes; it is probable that these cases were really of the congestive type.

The diagnostic part of the volume should prove of great value as a book of reference and as a practical guide in the various methods of utero-salpingography. The section on radiation therapy gives some useful references to the work of various authorities but is not of the same practical value as the rest of the book. Every gynæcologist will agree with the author that radiotherapeutic abortion by means of X rays is not justifiable; but surely in order to emphasise this it is not necessary in a book on radiology to give a detailed description of how the author produces abortion by mechanical methods. Finally, there is appended a very full bibliography and carefully compiled subject index.

Menschliche Auslese und Rassenhygiene.

Third edition. By Dr. FRITZ LENZ, Professor der Rassenhygiene an der Universität, München. Munich: J. F. Lehmanns. 1931. Pp. 594. Mk.17.

THERE have been considerable changes in this work since the first edition ten years ago; it now appears as a text-book of eugenics in the widest sense, and includes also a good deal of politics and sociology.

The first part deals with selection in man, especially biological influences, and the part played by acute infectious diseases, tuberculosis, venereal disease, infantile maladies, alcohol, and war. A study of the effect of selection upon the efficiency in modern life of the various systems of the human body is followed by rather controversial sections on social and racial factors in selection, with a thorough examination of diagnosed by the radiographic appearance rather than by the size of the head.

Prof. H. **Leith Murray**, while deprecating any substitution of radiography for careful palpation, said he had found it of extreme use in difficult cases. In many of these the patient was so fat that palpation was far from easy. No obstetrician should ever allow a case to enter labour without a full diagnosis of the presentation and the position having been made. Without the assistance of radiography this could not be guaranteed in all cases. Lack of flexion, too, might suggest a disproportion which was not, in fact, present. Here, also, modern radiology could be of great service in cases where palpation was inconclusive. With regard to the diagnosis of degrees of immaturity, while he had found radiography reasonably useful in cases with an undetermined amenorrhœa and a fat abdomen, he would require a longer series of cases than had been presented by Dr. Roberts before he agreed that radiography was superior to a study of the abdomen and the duration of amenorrhœa.

Dr. R. M. B. **MacKenna** read a note on Three Unusual Lesions of the Scalp.

At a pathological meeting held on Feb. 11th, the Vice-President, Mr. **Frank Jeans**, being in the chair, Prof. C. E. **Walker** read a paper on

Some Aspects of Cancer.

Prof. Walker said that a case of cancer might go through periods of improvement and regression. Very rarely there might be a spontaneous cure, and this seemed to be brought about by an overgrowth of fibrous tissue which destroyed the cancer cells. Connective tissue had been neglected by cytologists; the more delicate cell phenomena were not visible in ordinary histological and pathological specimens. Yet the connective tissue cells must multiply and differentiate freely and frequently. Any destruction of a tissue beyond a very small amount was replaced, not by the multiplication of the cells of the injured tissue, but by connective tissue forming a scar. There was a tendency for leucocytes to crowd round the advancing edges of malignant growths. Connective tissue and blood were closely related in their development. At some stages it was impossible to say whether a particular cell was going to become connective tissue, or the ancestor of a leucocyte. This close relationship continued throughout life. There was an insensible gradation between the wandering connective tissue cells and leucocytes. It was possible that the temporary improvement in some cancer cases was due to the leucocyte activity in the production of connective tissue having caught up and temporarily counterbalanced the multiplication of the cancer cells. It was probable that the reaction which followed many of the methods of treatment described was brought about in the same way. The result might be purely mechanical. Experiments seemed to show that cancer cells were more resistant to unfavourable factors in the environment than were the corresponding normal tissue cells. Therefore it might well be more profitable to seek some methods of stimulating the wandering cells that accumulate round a growth than to attempt to find something that would kill the cancer cells without killing the patient.

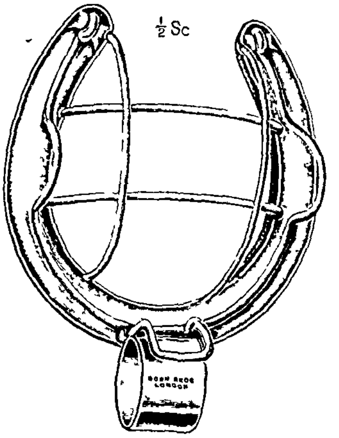
In the speaker's opinion, many of the methods of treatment described did have this affect to a partial extent, and it would probably be better to aim directly and deliberately at obtaining this result, and assist the wandering cells and their offspring in what appeared to be their function.

NEW INVENTIONS

AN ANÆSTHETIC MASK FOR OPHTHALMIC USE.

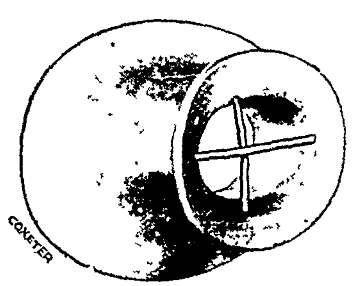
The mask here illustrated consists of a hemispherical wire dome on a horseshoe-shaped gutter. There is no bridge of wire at the nasal end. In practice, any mask which straddles the nose is in the surgeon's way, particularly during operations in the lower lid and lacrymal sac regions. The mask invariably gets pushed off the nose, allowing too great an air leak. This mask rests just at the end of the nose. The gap between the ends of the horseshoe gutter is bridged by the lint, which is intended to be worked up with the finger into a hood. This hood covers closely the lowest half-inch or so of the nose, and can be accommodated to any average-sized nose by merely working up with the finger, or pulling on the lint at the sides. The mouth and nostrils are thus closely covered, while the mask is as far away from the operator as possible. Other useful features are loops in the clamping wire, at the sides, to allow of the passage under the lint of a tube from the oxygen cylinder or Junker's bottle. The idea is that of Shipway's mask, but the soldered-i metal tubes were not thought necessary, as a medium sized rubber tube is clamped quite tightly enough t prevent accidental falling away, and a ring handle modified from Dunderdale's, is fixed to the chin en of the gutter. The makers are Messrs Down Brothers Ltd., London, S.E.

R. **Burns**, M.B.



A NEW ORAL PROP.

At the present time many operations not demand ing complete relaxation are performed under pu nitrous oxide-oxygen anæsthesia. In most cases th use of an artificial airway is neither practicable no necessary. In certain circumstances, however, such as nasal obstruction, the employment of an oral prop facilitates a smooth anæsthesia. Most of the available props have been designed for use in dental surgery, and are consequently unsuitable. The one illustrated is curved to conform to the shape of the front of the jaws, and is practically self-retaining. The posterior aperture is provided with cross wires to prevent occlusion by the tongue, while the anterior aperture is sufficiently wide to keep back the lips without getting in the way of a face-piece. The biting surfaces are covered with sheet lead to protect the dental enamel, and the whole is chromium plated.



It has been made to my design by Messrs. Coxeter.

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LITERATURE AND SAMPLES ON REQUEST FROM

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the data bearing on growth and quality of population. From a brief account of migration, both within the nation and abroad, Dr. Lenz passes on to consider the future of the great racial groups; his speculations are coloured by his predominant concern about the fate of the Nordic peoples.

The second part of the book is devoted to practical eugenics. Legislative control of marriage and measures for preventing or advising against undesirable procreation are discussed as they concern society in general, and as they determine the private life of the individual and the family. Here, too, the author's nationalist preoccupations loom large. The field of racial hygiene is covered in this large book with great, if biased thoroughness, and the personal attitude of the author is never in doubt; so much so that in many places the book reads more like a manifesto than a treatise. Learned, sincere, but often partisan and intemperate in its zeal, it cannot be regarded as a satisfactory exposition of eugenic doctrine, as understood in this country at any rate, though it is excellent in its presentation of the great range of eugenic problems and their paramount importance for occidental nations.

A Manual of General Practice.

Second edition. By W. STANLEY SYKES, M.A., M.B. Camb., D.P.H. London: H. K. Lewis and Co., Ltd. 1931. Pp. 213. 7*s.* 6*d.*

THIS useful book, of which a second edition has now appeared, fulfils a definite purpose in describing the sides of general practice which are not often considered by newly qualified men. Many valuable hints and facts are given on such varied subjects as the start in practice, conduct of practice, treatment, certificates, dispensing and drugs, book-keeping, lists of necessary instruments, and the working of the national health insurance. The chapter on the diseases of general practice is perhaps the least satisfactory. It is a book that should find its way into the library of every medical school, and will doubtless be purchased by many who read it there to their great advantage. With the help of such a book as this the start in practice becomes considerably simplified.

The Neural Energy Constant.

A Study of the Bases of Consciousness. By JOHN BOSTOCK, M.B., D.P.M., Honorary Neurologist, Brisbane General Hospital. London: George Allen and Unwin, Ltd. 1931. Pp. 178. 6*s.*

THE object of this essay is to bring forward a neural theory of human behaviour; it belongs entirely to behaviourism and does not bow the knee to any psychological theory, although the presiding deity is, in the author's regard, the faculty of awareness which is a suspiciously psychological concept. Primitive consciousness is pure awareness and its guiding motive is the urge to adjustment. Awareness and emotion are localised in the optic thalamus. This is the mechanism for coarse adjustment to environment, whereas fine adjustment is implemented by the cerebral cortex. There is a constant of neural energy and in any act of adjustment a minimum number of neurones is operative. The theory of neural energy, in Dr. Bostock's estimation, explains inhibition and sleep on the basis of an activity akin to McDougall's theory of drainage. While energy remains constant, it is repeatedly passing from one minimal neural set to another in order that accurate adjustment to environment should be possible. Sleep is a dissociation of the centres of awareness, emotion, and fine adjustment, and the author feels that dreams can be classified on the basis of such dissociation, and that they do not call for a theory of the unconscious, which to him means a brain within a brain. The thesis is distinctly a diagrammatic one, and on the basis of neural function it gives a reasonable picture of behaviour in terms of nerve structure. In our view Dr. Bostock places too much reliance upon the fiction of localisation, which the work of C. S. Lashley in recent years has somewhat invalidated. The frequent inclusion of psychological terms in what is a purely neurological explanation shows that we are still far from an adequate mechanical explanation of behaviour in terms of the nervous system. When behaviourists suffer the inclusion of psychological terms, it would appear that after all psychology is not without its uses, and perhaps that the study of the organism as a whole will profit if it pursues its course in psychological terms, leaving the neurologists to translate behaviour into the language of neurones. Dr. Bostock evidently does not feel it necessary to examine the concept of neural energy, which other neurologists find unsatisfactory.

History of Scottish Medicine.

Second edition. By JOHN D. COMRIE, B.Sc., M.D London: Baillière, Tindall and Cox. 1932. 2 vols Pp. 852. With 2 plates and 404 figs. in text. £2 10s

THESE two handsome volumes, compiled by the University lecturer on medical history at Edinburgh owe their inspiration to Sir Henry Wellcome, and are issued by the publishers for the Wellcome Historical Medical Museum. Dr. Comrie is well known as a master of medical history, and has held his chair at Edinburgh for more than 20 years with distinction. He covers fairly the whole range o his subject as illustrated by Scottish events and ha produced a work of interest to archæologists, biographers, and doctors alike. The first chapter deal with medical folk-lore—Gaelic manuscripts hereditary families of doctors, charms, spells, and amulets; thence we pass to the consideration o early public health measures against leprosy, syphilis and plague; the "Seal of Cause," the charte granted by King James IV. in 1505 to the Guild o Barbers and Surgeons at Edinburgh is reproduced in facsimile, and the origins of the Royal Corporation are set out. The second volume starts with th story of military medical practice in the eighteenth century in Scotland, and gives the interesting biographies of Pringle and Prince Charlie's famou doctor Sir Stuart Threipland. The personalities which have distinguished the Edinburgh Medical School then come in for full reference, the period o the great teachers, the Monros, the Bells, Syme Liston, and Simpson being dealt with in detail Further chapters are devoted to the rise of the medical schools of St. Andrew's, Aberdeen, and Glasgow, and, both topically and pictorially, every aid is given throughout by free illustration.

These volumes are an expansion of a book o the same subject written five years ago on the occasion of the inauguration of the section of medical histor at the meeting in Edinburgh of the British Medica Association, and certain of the material has also appeared in the *Edinburgh Medical Journal* and the *British Medical Journal*. The work will be esteemed in all medical libraries as a beautifully produced and convenient source of reference.

THE LANCET.

NDON: SATURDAY, FEBRUARY 27, 1932.

RADIUM AND THE PUBLIC.

HE fragmentation of the four-gramme bomb adium lent to the Westminster Hospital has accompanied in the daily press by an explosion se loudness is disproportionate but understand-. On the KING's recovery from illness much ey was spent on the purchase of radium great hopes were founded on the immediate ng of lives to be effected by the provision the ability to use a prodigious supply of a and potent remedy. Any setback in the very of the goods was bound to cause acute ppointment, and the letter over six medical es in the *Times* of Feb. 9th, containing a test against the decision of the National Radium mission to withdraw the bomb, released this espread feeling of disappointment and led to hasty expression of doubt whether those to m the radium was entrusted were acting wisely. one questioned the motives of the Commission, there has been sharp criticism of its judgment. letter in the *Times* stated categorically that ain types of cancer are better treated by the nb than by any other method of using radium, equally categorically that surgical operations being done in this country which are no longer ifiable in view of the possibilities held out by iological treatment.

Ve need not set out here the arduous work of Radium Commission in developing radium tres in various parts of the country, and in bining the Mount Vernon Hospital and the dium Institute into a post-graduate radium ool; but it may be well briefly to recapitulate at led to the decision to entrust so large a mass radium—one-sixth of the whole stock—to a ticular institution for a particular purpose. e Radium Subcommittee of the Committee of il Research, whose report preceded the appointnt of Radium Trustees and of the Radium mmission, remarked on the inadequacy of our sent knowledge to decide whether radium is st applied at close quarters to malignant growths thin the body or whether the future lies rather th massive doses of penetrating rays applied at listance. Some of the most far-seeing of radium rkers at that time regarded the logical development of contemporary knowledge to be the use large quantities of radium at a distance from the dy, enabling a wide field to be covered and a rly homogeneous intensity of irradiation to be ven at a moderate depth below the surface. was to give effect to this view that one of the st acts of the Radium Commission was the rchase of a four-gramme bomb of radium in der to try out a method of treatment which had been used for some time previous in Paris and Stockholm. The results obtained abroad were, in the Commission's judgment, "undetermined" and the experience gained not sufficiently encouraging to justify the acquisition at that time of more than a single such bomb of radium. In their first annual report, and indeed in every report which the Commission has issued, it has never failed to emphasize the fact that at present radium is a very dangerous weapon and one which, unless used with the greatest skill, care, and precaution, may easily be productive of more harm than good. A year later it was represented to the Commission by medical representatives of the institution that the results so far obtained with the bomb were of such a nature that they did not wish to continue work with it unless divided up into smaller units. Acting on this report the Commission decided that the continued use of the bomb in its present form was uneconomic. No doubt the test had been a very severe one for any form of treatment inasmuch as, in two of the regions chosen surface therapy with radium had already proved inefficacious. It would be idle for anyone to criticise the wisdom of the Commission's decision without seeing the actual protocols of cases treated, but it may be recalled that at the International Congress of Radiology, held last July, REGAUD and MONOD admitted that 17 out of the 19 cases of carcinoma of the stomach treated with the bomb at the Radium Institute in Paris during the years 1925–29 were already dead; and only one of seven cases of carcinoma of the bladder treated from 1927–29 was still alive in 1931. No doubt in Paris, as in the other capitals where radium has been available in this form, the treatment has been something in the nature of a clinical experiment of which the results are not yet known and in regard to which, as our own Commission has said, at least five years of further experience and coordinated research will be required before any final verdict can be expected. The disassembling of the bomb is in no sense a final and irrevocable act. It is simply proposed to redistribute its contents into four units each of one gramme. None of the tubes in which the radium is contained is to be broken up, and, even were this the case, its redistribution into smaller or larger units, though a highly technical matter, is one which would present no particular difficulty. The act does not mean (to use the words of an official communication to the press) that the Commission has lost faith or interest in bomb therapy, but that further experience is desirable before the treatment of patients with the larger type of bomb is continued under its auspices.

Mr. STANFORD CADE and his five co-signatories to the letter in the *Times* urged the immediate appointment by Parliament of a committee of inquiry to consider how best to advance radiotherapy, especially in its research aspects. They state, as we have noted, that certain types of cancer are better treated by the bomb than by any other method. There is evidently on this point a definite cleavage of opinion within the medical profession in this country and one that is hardly

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[*See also pp.* 19, 28, & 29.

nd scientific equipment. the perfect nursing home. ith all the resources of a modern hospital. It is un by a board of directors for profit, but the ishes of the medical staff will, it is understood. paramount, in respect of the interests of their harges. The chairman is the Duke of ATHOLL nd the house governor is Sir ERNEST MORRIS. ell known as the director of the London Hospital or many years. Thirty-six consultants form what known as the "medical group." Each of them as a consulting-room and an office in the building: hese they rent from the directors in the ordinary ay, and they have first call on the beds. The Duke of ATHOLL, however, pointed out in his peech at the opening that the clinic is not a "tied house" but that any member of the medical rofession can secure a bed for a patient if he wishes. When the clinic is full there will be two resident medical officers, but any general practitioner whose patient enters the clinic can continue to attend, together with the consultant of his choice. s in an ordinary nursing home, except that the use of the operating theatres is limited to surgeons on the staff of recognised teaching hospitals. Every nurse on the staff is State-registered and the porters and attendants are all ex-Service men personally selected by the chairman; and the chef comes, we learn, from a well-known restaurant. The pathological and radiological departments are run by a separate company formed by the medical group. Beyond a moderate interest on the money subscribed, all profits will be devoted to improvement of equipment and the reduction of fees to patients of the clinic who cannot afford the ordinary rate. Only members of the group will have the privilege of obtaining reduced rates for those under their care who cannot afford the customary rates, which will always be charged to any outside practitioners who make use of the laboratories.

The building occupies a site of two and a half acres and has cost over £430,000. The rooms are distributed over ten floors and there is nearly a mile of rubber-paved corridors, all of which are lit by a system of glass-fronted alcoves; hung across every corridor there is a glass sign-board bearing the name of every member of the staff. so that when he is wanted his name can be illuminated in all parts of the building. Nearly all the patients' rooms front on to the courtyard. so that they are as far as possible from street noise. Where necessary, double windows are provided. and the problem of vibration has been overcome by padding the steel foundations with heavy felt. Every room has its own hot and cold water-supply, telephone, bathroom, and lavatory, and all the furniture is of walnut or African mahogany covered with cellulose. so that no polishing is needed. Each bed has a three-button switch beside it, so that the patient can press a red light to indicate that he wishes to be left quiet, a blue light when he wants to call a nurse. and a green light when he wants to call a maid. These lights shine outside in the corridor and also show a small tell-tale light in the room to assure the patient that his apparatus is working. There are no bells or buzzers. One floor is to be devoted to children and another to dietetic cases, while the seventh floor is for maternity and includes two special labour rooms and a roof garden for the babies. On the eighth floor are the seven operating theatres. including a dental theatre and an ear, nose. and throat theatre. Each is equipped with sterilising. lighting, and ventilating apparatus, not of any predominant British production.

The cheapest room is priced at eight guineas a week, and the "luxury suites," at thirty-five guineas, include a second room for a relative or maid and a nicely furnished sitting-room. "This," said Lord MOYNIHAN at the opening, "is a new venture, a venture fraught with the deepest significance to the profession and to the public . . . a clinic to satisfy the most fastidious demands." The London Clinic should offer unusual opportunities for team-work among specialists, and for the collection of statistics.

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A SCHOOL HEALTH SERVICE.

IT was the tragedy of Dr. Parlane Kinloch's career that he just did not live to see the larger fruits of his administrative genius. His own department was strengthened and remodelled but the time was too short for the close appreciation of the difficulties of medical men and other health workers in the field, which was his special gift, to take full effect. In a letter to Sir Arthur Newsholme, written a day or two before his death, he admitted that his review of the health services with reference to efficiency and results was compelling him to the conclusion of the need for definite reorientation. "At this stage," he wrote, "I would illustrate my point by reference to any one of our services, say, the school health service. At the initiation of the service. I think we all generally took the view that, with a system of periodic examination of school-children, we should be able to detect divergencies from health and minor and major defects, the correction of which would prevent the development of more serious disease. The defects thrown up by the school health service are, in order of frequency, carious teeth, diseased tonsils and adenoids, enlarged glands, rickets, discharging ears, &c., and it is obvious that these conditions are either the late, and in some cases, the irreparable effects of malnutrition or the end-products of earlier infectious diseases, including catarrhal and respiratory infections. In other words, routine inspection is revealing conditions that cannot properly be remedied as detected, and it would appear that we must go much further back and secure the adequate nutrition of the expectant mother and of the infant and growing child in its earliest years; we must improve the diet to increase resistance to the infections whose end-products are revealed by school health inspection; and we must provide a medical service that will deal with infections in their earliest stages and so by early and intensive treatment prevent complications and sequelæ. The school medical service," Dr. Kinloch went on to say, "yields no evidence of the incidence of morbidity in child life. Whenever a child becomes ill, it disappears from the school health service and comes under the care of the family doctor." And he concluded with the pregnant remark: "It seems to me that we shall have to swing the whole service into the hands of the general practitioner and concentrate on fitting him to discharge the functions that this proposal requires of him."

likely to be reconciled by intervention from without. Lord DAWSON and Lord MOYNIHAN are unquestionably right in saying that the duty of instituting such an inquiry belongs to the medical profession itself. Doubts which have been raised as to the disposal of funds by the Radium Commission, and the competence of the Commission itself, could be set at rest by a public inquiry, if they had not already been set at rest by simpler means. But the ascertaining of clinical and experimental facts, the pooling of experience, and the weighing of conflicting views are the only bases of reconciliation and future action. These are the task of medicine.

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RHEUMATIC INFECTION IN CHILDHOOD.

IN Cardiff C. J. MCSWEENEY[1] finds that the incidence of rheumatic carditis is 5·8 per 1000 of the elementary school population, while W. G. SAVAGE[2] has estimated the incidence in Bristol at 7·7. The average figure for the counties round Bristol was in the neighbourhood of 2 per 1000, and this strongly suggests that there is some factor in urban life which plays an important part in rheumatic infection. MCSWEENEY notes that over 66 per cent. of the cases occur in the cold wet months of winter and spring, and that in over 73 per cent. the disease comes on between the ages of 5 and 10. There was no appreciable association of rheumatism with damp houses, dental caries, state of the tonsils, or frequency of sore-throats. Cardiff is fortunate in having special hospital accommodation for these children, and it appears that at least one bed for every 1000 of the school population is needed for their efficient treatment. The value of this hospital treatment is shown by the fact that, in the period reviewed, of the total 222 children admitted only 29 had normal hearts, but 135 were discharged with no demonstrable cardiac lesion. Incidentally it was observed that children treated in open-air shelters improved more rapidly and relapsed less often after discharge than those who slept indoors. The Cardiff experience also supported the opinion that tonsillectomy does little to prevent the onset or decrease the relapses of rheumatism in childhood.

Six hundred of the Cardiff children were grouped according to their social status in an attempt to assess the significance of gross environmental factors in the ætiology of the disease. It was shown once more that rheumatic children are seldom met with in well-to-do homes, and also that the incidence is greatest not among destitute recipients of public assistance but among those who, without actually suffering privation, have a struggle to make ends meet. That rheumatic infection may occur amongst public school-children is shown by W. H. BRADLEY, who has lately recorded[3] two epidemics in a public school. These epidemics were closely associated, and ran parallel with epidemics of sore-throat due to a hæmolytic streptococcus. The rheumatism followed the nasopharyngitis, when this was recognisable, after an interval, in the way described by B. E. SCHLESINGER and W. SHELDON, which is held to suggest an allergic state. In the two epidemics different strains of streptococcus were isolated, and the sore-throats which they produced were distinct in their clinical appearances. BRADLEY therefore agrees with SHELDON that while rheumatism itself is not infective the preceding nasopharyngitis, which *sensitises the patient*, probably spreads as a droplet infection.

A difficulty that confronts all students of rheumatic carditis is how to know when the patient may safely be released from active restraint and allowed to return, partially at any rate, to a normal life. This is largely dependent on the question, not yet definitely answered, whether the morbid process is a drawn-out smouldering infection like tuberculosis, or consists of a series of relapses with cessation of activity in the interval. White blood-cell counts have in general proved of little value in determining the activity or otherwise of the disease, but in our issue of Jan. 9th W. W. PAYNE and also F. BACH and N. GRAY HILL showed that the sedimentation rate of the blood may be useful in this respect. A raised pulse-rate has long been regarded as an indication of a progressive cardiac lesion, but since the pulse-rate is easily affected by purely psychic factors its value as an index of activity is largely vitiated. SCHLESINGER[4] has tried to get over this difficulty by studying the pulse-rate during sleep. He finds that the normal sleeping pulse-rate is on the average 10 lower than the "alert" rate. From his study he believes that if the sleeping pulse-rate is raised and approximates to the alert rate so that the normal difference is abolished, we have an indication of active carditis. Even if this difference is absent, a sleeping pulse-rate persistently above normal is in his opinion strongly suggestive of activity.

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THE LONDON CLINIC AND NURSING HOME.

IT has often been pointed out that the most modern and elaborate equipment for the treatment of disease is available in this country only for the poor and the rich. But though the rich can obtain the advantages, the different branches of treatment are never found under one roof. While an expensive nursing home may offer a comfortable room, a good cuisine, first-class nursing, and an up-to-date theatre, the pathological investigations will have to be made somewhere else and usually the X ray examination somewhere else again, while consultants who have equipped themselves with special diagnostic apparatus may have to be visited in yet other neighbourhoods. Even the very rich find the procedure dear. It is the object of the promoters of the London Clinic and Nursing Home, which was opened by the Duchess of YORK last week, to provide full facility for the diagnosis and treatment of disease under one roof and *at a price which the middle class can afford.*

The great building at the north end of Harley-street and Devonshire-place claims to be, in design cases. Miss Mary Botsford, of San Francisco, the President of the Associated Anæsthetists of the United States and Canada, pleads for the recognition of "anæsthesiology" as a medical specialty by the American Medical Association and a requirement for its teaching in the medical schools. The last appears to us of vital importance. Without well-qualified teachers and compulsory attendance of students, anæsthesia can never receive the attention which it deserves from the point of view of the safety and the welfare of the patient. In this country we have gone some way in this proper direction, but the future is likely to see us go still further and we make no doubt that the United States will emulate our action, if they do not set us an example by making greater strides than ourselves.

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[1] Arch. Dis. Child., December, 1931, p. 367.

[2] Interim Report of Inquiry in Gloucestershire, Somerset, and Wiltshire. Brit. Med. Jour., 1931, ii. (Suppl., p. 37).

[3] Quart. Jour. Med., January, 1932, p. 79.

[4] Ibid., p. 67.

A SYMPOSIUM ON PROSTATECTOMY.

THE ideal of primary closure of the bladder after suprapubic prostatectomy has for some time been before the profession. It is obvious that if the bladder can be closed by primary suture convalescence will be shortened, and many of the patient's discomforts prevented. But many of those who have attempted to gain this advantage for their patients have finally abandoned closure either because they considered it dangerous or because they found the technical difficulties of the operation insuperable. At a discussion on prostatectomy reported in the *Journal of the American Medical Association* (1931, xcvii., 1768), Dr. A. H. Peacock, of Seattle, tried to show that suture and closure is not a difficult operation, that no special instruments are required for carrying it out, and that the ideal behind it is surgically correct. In order that closure may be effected, two conditions are essential, first, complete hæmostasis, and, second, unobstructed urethral drainage. In achieving the former reliance is placed on properly placed sutures. A good view of the base of the bladder is obtained by means of a self-retaining retractor, and the sutures inserted either by means of a Young's boomerang needle, or else by using an ordinary long holder with a short curved needle. The second essential of drainage is obtained by an in-dwelling catheter, preferable a No. 26 or 28 French whistle-tipped catheter. This is anchored in position by passing one of the prostatic sutures through its eye. The catheter is removed at the end of three or four days and a smaller one inserted in its place. The average time for the in-dwelling catheter in a series of 50 cases was ten days. The incidence of wound leakage was small, and when leakage did occur it usually indicated an obstructed catheter. The average time before normal voiding was 12 days. It was claimed that by closing the bladder the comfort of the patient was greatly increased and a great saving in dressings effected. Post-operative bleeding was practically eliminated, and sloughing of the suprapubic wound never occurred.

Although there are few surgeons who would deny Dr. Peacock's contention that closure of the bladder is in keeping with general surgical principles, there would appear to be still fewer who at the present moment are prepared to follow his lead. Amongst those who took part in the discussion that followed his paper, as well as in a similar discussion held in this country about a year ago,[1] it was the general opinion that closure of the bladder is too dangerous to be adopted as a routine measure. However carefully sutures are placed, and however great the attention paid to drainage, there must always be the risk of clot retention and of obstruction. But even if Dr. Peacock, and Mr. S. H. Harris, of Sydney, have not succeeded in persuading genito-urinary surgeons in general to follow their lead they will have the satisfaction of knowing that they are working in the right direction, and that at some not too distant date their names will be recorded as pioneers in prostatic surgery.

In a contribution to the discussion by Dr. Edwin Davis, of Omaha, great emphasis was laid on the value of sacral anæsthesia in perineal prostatectomy. Anæsthesia is undoubtedly an important consideration in prostatectomy, and both inhalation and intraspinal anæsthesias carry with them definite risks. The objection that has been urged against sacral anæsthesia is that it is difficult to carry out, and that it is unreliable. Dr. W. W. Babcock has even stated that it is only efficient in 45 per cent. of cases. It is possible, however, that the reputation of sacral anæsthesia has suffered by confusion with the far less efficient method of caudal anæsthesia. At any rate, Dr. J. S. Lundy has reported that in a series of 318 cases of suprapubic prostatectomy carried out under sacral block combined with infiltration of the anterior abdominal wall, good anæsthesia was obtained in 96·5 per cent. of cases. Dr. Davis's analysis of 378 consecutive cases of perineal prostatectomy performed under sacral anæsthesia reveals the importance of technique. He found that although in the first series he had 20 per cent. of failures, amongst the last 229 cases there has not been one failure. We may therefore assume that provided the method is skilfully carried out it is extremely reliable. The objection that it demands considerable time and trouble on the part of the surgeon is less easily put on one side. The time required depends on the skill and experience of the operator. In Dr. Davis's hands sacral anæsthesia can be achieved in 12½ minutes. The maximum time required, in cases of unusual difficulty, was 30 minutes. Dr. Davis believes firmly that the use of sacral anæsthesia has contributed greatly to the lowering of his mortality-rate. In his series of 378 cases of perineal prostatectomy he has only had nine deaths, giving a mortality-rate as low as 2·38 per cent. Whatever the difficulties entailed in learning the technique of sacral anæsthesia, it would seem fully worth while to overcome them.

The last paper of the symposium deals with another aspect of the subject—namely, whether it is possible in certain cases to relieve obstruction by methods less drastic than prostatectomy. It is curious that this question should have provoked so many heated discussions amongst genito-urinary surgeons. There are two camps—those who are enthusiastic on per-urethral methods, and those who condemn them as worthless, and, because they give a false sense of security, even dangerous. The truth surely lies midway between these two schools of thought. Enthusiasts have erred in attempting to apply the method to cases for which it is unsuited, and opponents have too sweepingly denied its utility in those for which it is appropriate. To the latter we would commend Dr. Davis's paper. No one who is not blindly prejudiced could read it without being impressed with the results given by resection in his hands. The operation has the great advantage of being a comparatively trifling one, and of incapacitating the patient for only a short time. The average

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[1] See THE LANCET, 1930, i., 1185.

ANNOTATIONS

BRITISH POST-GRADUATE MEDICAL SCHOOL.

ALTHOUGH the post-graduate school at Hammersmith is unlikely to come into being before October of next year at the earliest, the discussions for its establishment have at last reached the stage when plans have been approved both by the London County Council and the governing body of the School. These plans include developments and adaptations of the Hammersmith Hospital, of which Sir Thomas Carey Evans is now director. Provisional plans were originally prepared for a comprehensive scheme estimated to cost £250,000, but in view of the national financial position which developed last September it became apparent that the Government were not prepared to expend so large a sum. The L.C.C. architect was consequently directed to prepare a less ambitious scheme, the total cost of which was estimated not to exceed £200,000, it being understood that the Government's contribution towards the cost would be about £100,000. It is the plans for this modified scheme which have now been approved. The new scheme provides not only for a medical school, but for casualty, receiving, and out-patient departments in two new blocks, a new ward, a central dressings sterilising room, massage and light sections. The new blocks will displace certain existing portions of the hospital buildings and, apart from the cost of equipment and furniture, are estimated to cost £160,000. Working drawings will now be taken in hand. In the meantime it will be noted with interest that the plastic surgery unit formerly at St. James's Hospital has been transferred to Hammersmith, where Sir Harold Gillies will act in an honorary capacity as chief surgeon. Mr. T. Pomfret Kilner is acting in a temporary capacity as plastic surgeon, and an assistant plastic surgeon is to be appointed.

THE DRINK PROBLEM.

BEFORE the appointment of the Royal Commission, the report of which was recently discussed in THE LANCET, a group of distinguished public men and women started an inquiry into the medical, social, and economic aspects of the alcohol problem in Great Britain. The only instruction they gave their experts and investigators was that the facts must be presented without bias or prejudice. The results have now been published in two volumes.[1] The first, which may roughly be called the medical volume, covers much the same ground as the admirable symposium published by the Medical Research Council for the Liquor Control Board in 1924. The account now published is sane and reasonable, though enthusiasts will find its impartiality rather dull. The authors have the advantage of being able to draw on Dr. H. M. Vernon's excellent book published in 1928. The chapter on the mental effects (apart from insanity) is easily the best; fortunately, it has also become, nowadays, the most important. As the editors remark in the preface, some differences of opinion among the cited authorities are inevitable; there seems too to be some mental conflict among the experts who write the various chapters. Thus, on p. 84 it is opined that "medicinal doses" of alcohol are too small to make any appreciable difference in acute infections; on pp. 90 and 91 statistical evidence is quoted at some length to show that alcohol does either no good or harm in the treatment of pneumonia; on p. 220 the same experts say "the treatment of fevers would be difficult indeed were this drug [alcohol] to be entirely removed." It is perhaps well that the reader is warned not to expect *ex cathedra* pronouncements. Each chapter has a useful list of references to the literature.

Most medical men will find the second volume less familiar and more interesting. It deals with the economic aspects of the production and consumption of alcoholic drinks, and with the relation of drink to industrial efficiency, poverty, and crime. Fresh, careful, and apparently impartial inquiries reveal that in industry there has been a great diminution in drinking and that the younger generation are very different from their fathers; they must needs keep better time in the works and outside they want to dance and play games and have decent homes, and so give drink the go-bye. Investigations in York and Edinburgh showed that about 25 or 30 per cent. of the whole of the poverty in a typical working-class district was caused wholly or partly by drink. Of various groups of crime, from 10 to 40 per cent. were found to be alcoholic in origin. Whether the employment efficiency of the drink trade is as high as that of other industries is left an open question; it seems to involve about 400,000 persons and their activities led to our spending on the average 124s. per head of the population of Great Britain in 1930. The sum of the whole matter seems to be that the harmful effects of alcoholic excess are indisputable and not disputed. What is needed now is a correct evaluation of the influence of small and moderate doses on judgment, dexterity, and other finer activities of the nervous system.

TRAINING IN ANÆSTHETICS.

THE lively interest in anæsthetics and the rapidly growing importance attached to this branch of work in America are well illustrated in the January-February number of *Anæsthesia and Analgesia*. It is obvious that the days of the "technician" or trained lay anæsthetist, whether a nurse or otherwise, are numbered in the United States. California has already abolished this kind of administrator, the State Legislature when amending the Medical Practice Act having adopted a resolution of the California State Medical Society to the effect that "the administration of an anæsthetic is always the function of a legally qualified medical practitioner," and that "the society condemns under all circumstances the training and qualification of lay persons as anæsthetists." The American College of Surgeons in their "Hospital Standardisation Report" lay it down that "the rapid advance made in anæsthesia during recent years has greatly improved methods of administration . . . the administration of anæsthetics in hospitals has considerable room for improvement. This can be accomplished in great degree by employing only qualified experienced persons in this department." To assure safety and efficiency there should be (1) an organised department of anæsthesia in charge of a qualified medical graduate who has had special instruction in anæsthesia; (2) a staff of trained and experienced assistants. The report also points out the desirability of complete examination and review of laboratory findings for every patient before operation and of the efficient following up of all anæsthetic unhappiness, the kind of home where the child never knew what was going to happen next. Yet there seemed to be a certain inherent factor as well, since children in exactly comparable surroundings might fail to show anxiety symptoms. Dr. Moodie thinks that he has now collected some cases where it is absolutely certain that the child cannot, in the ordinary sense of the word, have known of certain home situations such as conditions leading up to a divorce, and yet it has quite clearly "sensed" the position and taken refuge in some form of flight. He deprecated the value of the intelligence quotient alone, but emphasised by illustration the tremendous amount of information that can be obtained by an intelligent psychologist who makes notes of the child's temperament while putting him through the ordinary intelligence tests. In this way, he said, much could be learnt about the child's emotional reactions without any of that difficult, tedious, and almost invariably destructive prying into his mind which is essential if a temperament estimate is to be made directly. The child takes the intelligence tests as a kind of school examination and is unaware of the observation that is being made at the same time. He was able to give two answers to the question: why does a child adopt any particular form of bad behaviour? In the first place the particular form adopted is nearly always a regression: if the parent complains that the boy wets the bed, the history will usually show enuresis at an earlier age. In the same way, if a child assumes an attitude such as shyness or aggressiveness, a review of the past will usually show that this attitude has been successful in earlier days. In the second place there is the factor of direct example; the need for bad behaviour having arisen in the child's psychology, he may simply copy something that he sees around him or that is suggested to him.

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[1] A Review of the Effects of Alcohol on Man. London: Gollancz. 1931. Pp. 300. 8*s*. 6*d*. The Social and Economic Aspects of the Drink Problem. Same publishers. 1931. Pp. 180. 5*s*.

It is of interest to learn that Dr. Moodie could find in his clinic experience no evidence that these behaviour patterns are inborn.

INJURIES OF THE COMMON AND HEPATIC DUCTS.

THERE can be few operations in surgery which call for greater craftsmanship and resource on the part of the surgeon than those undertaken for the repair of injury to the bile-duct. Howard M. Clute,[1] discussing 25 cases of this condition operated on in the Lahey Clinic at Boston, divides the causes of stricture of the common duct into four groups: (1) those resulting from cholangitis; (2) those due to ulceration round a stone; (3) those resulting from severe blows or crushing injuries; and (4) those caused by injury to the ducts inflicted at the time of some operation on the biliary apparatus. Of the cases under review, 20 belong to group 4, one to group 3, and four to group 2. Clute thinks that cholangitis is a very rare cause of stricture, basing his view on the fact that it has not occurred in his practice. E. S. Judd,[2] of the Mayo Clinic, on the other hand, considers cholangitis of the obliterative type to be the cause of a considerable proportion of strictures of the common duct that have been classified as traumatic, and gives evidence in support of his views. Clute discusses the common causes of accidental injuries of the common duct during cholecystectomy, and rightly urges that where adequate exposure of the common and cystic ducts cannot be obtained—either because of technical difficulties or because of lack of operative skill—the procedure of choice is cholecystostomy. Should the duct be injured during operation, and if the injury is recognised at the time, its repair at once is not only relatively easy, but is usually followed by good results. Unfortunately the surgeon who is most likely to injure the duct is least likely to recognise what he has done, and the increasing frequency of this type of case makes it essential to realise the fact that gall-bladder surgery is not for the inexpert surgeon, for whom it holds many pitfalls.

The cases reported by Clute were treated by a variety of methods depending on the state of the injured duct. He has had no experience of either Walton's or Mayo's methods of anastomosis by means of a duodenal flap—methods which have given very good results in a number of cases. He has, however, performed 12 operations upon nine people with the object of establishing a complete external biliary fistula, and has succeeded in three. Several of these attempts were on very ill patients who had had multiple previous operations. Complete external biliary fistulæ have been transplanted into the stomach or duodenum seven times, either in cases where the fistula existed already, or after it had been produced surgically. Of these seven cases, three have been satisfactory, and four complete failures. Waltman Walters,[3] of the Mayo Clinic, reports five cases of the transplantation of complete external biliary fistulæ, with one death. Two cases had satisfactory results, and two were much improved but had some persisting symptoms. There can be no doubt that this method of establishing a complete external biliary fistula, and then transplanting the fistula into the stomach or duodenum, is one to be reserved only for cases in which the proximal end of the injured duct cannot be found, or when found is unsuitable for direct anastomosis. It is a formidable procedure, with many failures, but in successful cases it gives a possibility of relief to patients for whom otherwise little could be done.

PSEUDOPREGNANCY.

PSEUDOPREGNANCY is a well-known phenomenon in lower animals and is seen most simply in such animals as the rabbit and ferret which ovulate after coitus. If the buck is vasectomised in these animals, coitus, though sterile, is followed by ovulation and corpus luteum formation. The animals then develop hypertrophy of the breasts, proliferative changes can be demonstrated in the uterus, and in the case of the rabbit pseudopregnancy terminates about 19 days after the sterile coitus by the animal preparing a nest and by the secretion of milk in the breasts. In the majority of domesticated animals ovulation is spontaneous and takes place during the œstral phase of the sexual cycle. It has been shown that similar proliferation of the endometrium can be demonstrated during the corpus luteum phase in the absence of pregnancy, in the case of the bitch (Marshall and Halnan [4]), the sow (Corner [5]), the marsupial cat (Hill and O'Donoghue [6]), and the opossum (Hartman [7]). For these reasons Heape's scheme for the sexual cycle of animals has been modified and is now regarded as consisting of stay in hospital in this series was four days. Dr. Davis has designed an instrument of his own for the carrying out of resection. His resectoscope consists of a sheath with a finestrum ⅞ of an inch in length near the beak, an obturator to aid introduction, an indirect vision examining telescope, and the working parts. The working parts consist of a light carrier, water conduit, direct vision telescope, and a loop electrode. The loop is placed in front of the direct vision telescope, and is made to engage the obstructing tissue to be removed. By means of this instrument as much as 24·7 g. of prostatic tissue has been removed at a single sitting from an enlarged prostate. In only seven out of a total of 246 cases was it necessary to repeat the operation. Surely this is a record which would justify any surgeon in employing this method in suitable cases. In the discussions that followed, to which many prominent American urologists contributed, many opinions were expressed. General agreement was reached on one important point—that it was impossible to regard any particular set operation as applicable to all cases. The expert genito-urinary surgeon must be prepared to do either the suprapubic or the perineal operation, and to select the technique that is suited to the particular case with which he has to deal. Either of these operations may be desirable, or the comparatively trifling procedure of resection may be indicated. The expert must be master of all three methods of treatment, and should not be wedded to any one of them.

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[1] New Eng. Jour. Med., 1932, ccvi., No. 2.

[2] Ann. of Surg., 1926, lxxxiv., 404.

[3] Jour. Amer. Med. Assoc., 1931, xcvi., 1121.

[4] Proc. Roy. Soc. B., 1917, lxxxix.

[5] Contributions to Embryology, Carnegie Inst., Washington, 1921 and 1924, Nos. 64 and 75.

[6] Quart. Jour. Micros. Sci., 1913, lix.

[7] Amer. Jour. Anat., 1923, xxxii.

HOSPITAL COÖRDINATION IN MANCHESTER.

At the recent annual general meeting of the trustees of Manchester Royal Infirmary, Mr. Wilson Hey, chairman of the medical board, made some pointed comments upon what he described as the want of coördination among the local hospitals and the overlapping of services which "results in wastage of money and effort, and consequently in unnecessary suffering to the patients." Mr. Hey pointed out that the infirmary, with its satellites at Cheadle and Monsall, possesses specialists in every branch of medicine and is "almost an international hospital," but it cannot cope with the demand. "Patients wait for months in suffering for admission to its wards, while beds lie empty for months elsewhere." According to the latest report of the Manchester voluntary hospitals there is a daily average of 260 empty beds in the city out of a total of a little over 2000, excluding the municipal hospitals. The figures allow for keeping emergency beds in readiness. Mr. Hey went on to say that "on account of the want of organisation, urgencies and accidents and also chronic patients have to be taken first to one hospital and then transferred to another, often enough on the same day. Our expert abdominal surgeon is compelled to deal with fractures and our neurologist to operate upon abdomens. The inexperienced has thrust upon him cases requiring wise and rare judgment, and the experienced often wastes his time on trivialities." So far from the poor-law hospitals having fallen into a common line with the voluntary hospitals as the medical profession had expected, they remain isolated units still, as for the last 20 years, the dumping ground of the trivial, chronic, and dilatory cases, with which the rush of the general hospital cannot cope. "Our magnificent municipal hospitals," he said, "are worthy of better things than this."

In 1931 the Royal Infirmary dealt with 11,847 in-patients and 48,693 out-patients; there were, in addition, 1220 in-patients in the Barnes Convalescent Hospital at Cheadle. The cost per annum per bed occupied at the infirmary was £177 14*s.* 11*d.*, an increase over the previous year of nearly £10, and the average cost of each patient £8 5*s.* 7*d.* At the Barnes Hospital the cost per bed per annum was £89 14*s.* 10*d.* The total ordinary income of the infirmary and the Barnes Hospital was £94,629, against £96,653 in 1930 and £101,946 in 1929.

WHY DO CHILDREN BEHAVE BADLY?

The Child Guidance Clinic in Islington has now been running for three years and will in a very few days' time see its thousandth patient. Dr. William Moodie took the opportunity when addressing the Medical Officers of Schools' Association last week to give a résumé of the results and conclusions arrived at as the result of his work there. He laid it down in the first place that bad behaviour was not gratuitous and that its cause could often be found, the criterion for "cause" being that its alteration altered the behaviour. He declared himself as being unable to accept as satisfactory either the theory of original sin or the explanations of psycho-analysis; the only practical way, he said, was to consider the child as a person who must conform, as far as in him lay, to society and the standards of decent behaviour. There must be a compromise between freedom and repression, between individual tendencies and the needs of society. There had in recent years been a universal tendency to lessen repressive measures, a tendency which had perhaps gone too far. The child must be considered as a member of society and not merely as a unit. The children sent to his clinic were almost invariably referred on account of some social difficulty. Half of them came from elementary schools and a quarter from public schools, the remainder being of pre- or post-school age. In this connexion Dr. Letitia Fairfield, in the subsequent discussion, recalled an interesting inquiry into the offences considered most grave by a series of school teachers. At the top of the list had come all the symptoms of rebellion against authority, headed, in the case of women teachers, by swearing. At the bottom of the list, considered by the teachers unimportant, were those flights from reality—such as shyness, day-dreaming, and lack of attention—which psychologists know to constitute a far more serious threat to the value of the future citizen. Dr. Fairfield pleaded that teachers should learn to appreciate better the significance of bad behaviour in their children.

Although backwardness was the complaint for which the children in Dr. Moodie's clinic were referred in 25 per cent. of cases, and although it actually proved to be a factor in 50 per cent. of cases, the intelligence curve corresponded very closely to that of the population as a whole. After backwardness the commonest causes of complaint were, in order: stealing, nervousness, unmanageableness, lying, temper, enuresis, stammering, truancy, and lack of concentration. It had been found that these difficulties were nearly always grouped in fives; a child very seldom had only one such symptom. When the children were examined, gross physical defects were not commonly found—naturally such cases would go to a general hospital—but it was extremely common to find evidence of fatigue and conditions which in an adult would certainly be described as hyperthyroid anxiety states. Often these arose from environmental factors—fatigue from loss of sleep due to noisy or overcrowded bedrooms, and anxiety from broken homes, illegitimacy, and marital

SPECIAL ARTICLES

POLIOMYELO-ENCEPHALITIS
IN VICTORIA (1925–1931).
TREATMENT BY HUMAN IMMUNE SERUM.

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APRIL, 1925, TO AUGUST, 1931;

AND

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IN April, 1925, an increase in the incidence of liomyelitis in Melbourne suggested the possibility a severe epidemic, and an organisation[1] was formed prepare for this emergency. The six objectives en determined have been followed during the riod under review.

1. The preparation of a supply of serum from the od of persons who had had an attack of polio-yelitis within recent years.
2. The education of the medical profession in the ndrome of the preparalytic stage, and the education profession and public to the importance of diagnosis fore paralysis.
3. The provision to practitioners of help in diagnosis a consultant prepared, if the clinical findings stified the procedure, to carry out lumbar puncture d examination of the cerebro-spinal fluid at the dside.
4. Control of the distribution of serum to obviate aste and the possibility of bringing the therapy to disrepute by the use of serum in unsuitable or nproven cases.
5. The collection of clinical records to permit sessment of the value of the therapy.
6. The attempt to ensure that every paralysed atient received adequate after-care by splinting and uscle re-education.

Preparation of Serum.

By various means suitable donors were traced hrough searches made at hospitals, splint-makers, urgical boot-makers, records of notifications and avalid pensioners, house-to-house visits, and the liagnosis verified by examination of the residual aralysis. Fortunately, 12 young adults survived he epidemic which occurred during April and May, 925, and these proved our most valuable donors or some years—giving blood gratuitously until 1928, hen a system of payment was introduced. Details f the preparation of serum have been published n the *Medical Journal of Australia* in 1927[2] and 1928,[3] but in 1930 slight modifications of the method resulted in a higher yield of serum, thus lowering the cost of production. A brief description of the method will be given, because it is possible that the method of preparation adopted may influence the results obtained in treatment.

The donor being recumbent, the band of a sphygmomanometer is wrapped round the arm and the skin over the elbow cleansed with ether, soap, and acetone-cyllin-methylated spirits lotion. Sterile towels are applied. The needles used are freshly sharpened rustless steel needles of large calibre (1·65 mm. gauge). After boiling, the needle is rinsed with oxalate solution and connected by means of sterile paraffined rubber tubing to glass tubing, and thence to the receiving vessel, which contains a measured amount of 10 per cent. potassium oxalate solution. The arm band is inflated until the vein is evident, the needle being inserted with the point directed towards the hand. In most donors blood flows most quickly when the sphygmomanometer registers 30 mm. Hg. but the optimum pressure varies during each bleeding. The donor is told to open and shut the hand slowly, firmly, and steadily, and the receiving vessel is gently shaken as the blood enters. Ample supplies of blood have been obtained by venepuncture. Neither venesection nor aspiration has been found necessary. The quantity of blood withdrawn has been regulated by the donor's wishes, occupation, and condition, not by any limitation of the technique described. Table I. shows the amount of blood withdrawn during the period under review.

TABLE I.

Year ..	1925–1927.	1927–1928.	1929.	1930.	1931.	*Total* 1925–1931.
Total volume of blood during period	4,650 c.cm.	20,563 c.cm.	15,370 c.cm.	18,870 c.cm.	24,585 c.cm.	84,038 c.cm.
Number of bleedings	34	53	28	35	49	199
Average amount of blood withdrawn per bleeding	136·7 c.cm.	388 c.cm.	545 c.cm.	539 c.cm.	501·7 c.cm.	422 c.cm.

A sample of blood is taken for the Wassermann test from each specimen withdrawn. The collecting vessels containing fluid blood are taken to the laboratories where the blood is centrifuged. The supernatant plasma is then syphoned from the underlying closely packed corpuscles. The plasma from each patient is kept separate until the report of the Wassermann test is received, when the various quantities are pooled. In bleeding 83 persons we have not had a positive Wassermann reaction. After pooling, the plasma is distributed into clotting jars to which is added calcium chloride solution of specific gravity 1022, in amount as calculated from the table printed in the earlier publication.[2] A clot quickly forms, is expressed from the serum by means of superimposed brass weights, and the serum is then altered through Seitz E K special type of filter disc. No antiseptic has been added, but great care is taken during the procedure. A second filtration through a bacteria-proof filter is made, and exhaustive tests for aerobic and anaerobic organisms at 37° C. and at room temperature are made upon the samples of the serum in bulk. The serum is distributed in sealed ampoules, each containing 10 c.cm. of serum, and further sterility tests are made at the time of bottling. During the 21 days after withdrawal of blood the donors are watched for the development of any disease, such as measles, caused by filter-passing organisms. Table II. shows the percentage yield of serum and the average yield per donor.

TABLE II.

Year ..	1925–1927.	1927–1928.	1929.	1930.	1931.
Number of bleedings ..	34	53	28	35	49
Volume of blood obtained	4,650 c.cm.	20,563 c.cm.	15,370 c.cm.	18,870 c.cm.	24,585 c.cm.
Volume of serum obtained	1,789 c.cm.	7,820 c.cm.	6,050 c.cm.	8,500 c.cm.	12,500 c.cm.
Percentage yield of serum	38·2	38	38·9	45	50·8
Average yield of serum per donor	52·6 c.cm.	147·5 c.cm.	216 c.cm.	242·8 c.cm.	255·1 c.cm.

In 1930 the centrifuge was first used, and an increase in the percentage yield will be noticed for that year. The highest yield of serum from a single pool was 55·5 per cent., composed of serum from nine donors. In the earlier years the serum was grouped according to the interval which had elapsed since the onset of the disease of the donor, but in 1930 this method was abandoned, and we have in each group pooled sera from eight to eleven donors affected in pro-œstrus and the corpus luteum phase or the phase of pseudopregnancy. In the normal human menstrual cycle ovulation occurs about the fourteenth day after the beginning of the last menstrual period and an active corpus luteum persists in the ovaries until shortly before the onset of the menstrual discharge. The premenstrual phase of the human menstrual cycle is therefore homologous with the experimental pseudopregnancy of the rabbit and ferret and with the pseudopregnancy phase of the sexual cycles of such animals as the bitch and sow. In a recent paper D. Macomber [8] attempts to identify a separate clinical state of pseudopregnancy in the human female. Two cases are described in which patients passed decidual tissue from the uterus after having been 11 and 14 days overdue with their periods. In both cases chorionic villi could not be found in the discharge. In one case the husband was proved to have aspermia, in the other the husband's fertility was shown to be extremely low. The interpretation placed upon these cases is that they represent comparable states to the pseudopregnancy of lower animals. This interpretation of the two cases demands severe criticism. In one of the cases the patient is stated to have had irregular menstrual periods, in the other no details are given of the past menstrual history. It is not uncommon for women to have prolonged menstrual cycles and Wilfred Shaw [9] has shown that such cases can be attributed to irregular ovulation; it is therefore possible that the two cases can be explained along these lines. During the late premenstrual phase of the cycle the stroma cells of the endometrium hypertrophy to such a degree that they resemble the decidual cells of early pregnancy; indeed it is often difficult to distinguish between the decidual reaction of the late premenstrual phase and that of early pregnancy. Similarly ectopic decidual cells can be demonstrated in the ovaries during the late premenstrual phase of the cycle. Macomber's explanation of his cases is therefore unconvincing, for both the missed periods and the discharge of decidual tissue from the uterus can be accounted for without resorting to the hypothesis of a pseudopregnancy. Moreover, as has been indicated above, the premenstrual phase of the normal cycle is homologous with the pseudopregnancy of lower animals.

THE PAGET TRADITION.

Sir James Paget had many contemporaries of distinction but none of them has so captured the imagination of a generation that never knew him. His "Memoirs and Letters" are read and re-read by many who ordinarily have little taste for matters historical. When Prof. Grey Turner received the Henry J. Bigelow medal of the Massachusetts Medical Society at Boston last June it seemed quite natural to him and to his hearers that his address[10] should be about the "Paget tradition." There were special reasons, too, for the choice of subject. Paget was a man after Bigelow's own heart; in 1882 he was elected an honorary member of the society; and in company with Dr. Harvey Cushing, another member of the society, the lecturer was one of the six perpetual students of Paget's old hospital. Most of my teachers, Prof. Turner remarked, had come under the spell of Paget, with them his example was a tradition, from them the torch was thrown, and I felt I was only fulfilling a sacred trust to hand it on. Foremost in the Paget tradition he put his example as a worker, for like John Hunter his friends always found him employed, and it has been said that he so loved work that he estimated the worth of his acquaintances by their output of it. In public duty he was punctilious to a fault and careful of the time of others, as he would expect them to be of his own. As a medical writer he had no rival, using pure and perfect English without effort. In an age of orators he was acknowledged one of the best speakers of his time. Many of his published lectures rank among the classics of medical literature and are read to-day for their grace and charm, as well as for their wisdom. He made great contributions to clinical surgery, and his original papers on the diseases of the breast and of the bones associated with his name still remain complete and perfect descriptions. He might, concluded Prof. Turner, have been a success in any honourable walk of life, but he had chosen the profession of medicine, he loved his avocation, and had the highest sense of the importance and dignity of his calling. And in simple and reverent language, enhanced by apt quotations from Paget's writings, Prof. Turner drew a picture of the man as he lives in our memories, with his tenderness and austerity, the light heart of his seriousness, the gentleness of his firmness.

VOTING AT EPSOM COLLEGE.

WE are asked to give publicity to the following statement: "Although the Governors of Epsom College unanimously decided at an extraordinary general meeting in June, 1931, to take the necessary steps to abolish the voting system, no change can be made until the scheme has received Parliamentary consent. The earliest date at which Parliament can sanction the proposed legislative changes, coupled with the statutory requirements and other unavoidable preliminaries of an annual election by votes of the governors, makes the cancellation of this year's voting in June impracticable, and therefore it will be necessary to adhere to the system of voting for the year 1932. Voting papers will be forwarded to all governors in due course."

BLOOD-GROUPS AND PATERNITY.

IN Dublin lately the blood-group test of relationship was accepted as evidence, for the first time, it is said, in any court in the British Isles. A district justice had made a maintenance order against an elderly man on the complaint of a young woman on behalf of her illegitimate child. The defendant appealed to the circuit court, and evidence was produced to show by blood-grouping that he could not be the father of the child. The test was carried out in the presence of the solicitors of the two parties by Dr. G. C. Dockeray, Dr. J. H. Stephens, and Dr. J. McGrath. Other evidence was also produced, and the judge reversed the decision of the district justice. The test is widely used in Germany, Austria, and Scandinavia,[1] but, as already stated, we do not know of its application in this country. It may be recalled that the precipitin or immunological test for human blood was accepted in criminal cases in Ireland for some years before it appeared in the courts of Great Britain. It was introduced to Ireland by the late Prof. E. J. McWeeney.

WE regret to announce the death on Wednesday, Feb. 24th, of Sir Frederick Andrewes, F.R.S., Emeritus professor of pathology in the University of London.

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[8] Jour. Amer. Med. Assoc., Jan. 23rd, p. 301.

[9] Jour. Obst. and Gyn. Brit. Emp., 1929, xxxvi., 1.

[10] Published in New England Journal of Medicine, 1931, ccv., 622–9.

[1] See Schiff, F., THE LANCET, 1929, ii., 921.

e spine into hyperextension. If asked to fold his ms he tries to do this, but quickly reverts to the ipod position.

Differential Diagnosis.

The differential diagnosis [11] covers a wide field of nical medicine, and cannot be dealt with in detail re. The suspicious cases seen in consultation ring the six-year period may be classified as llows :—

(a) The group in which clinical examination has rendered nbar puncture unnecessary. (1) Acute febrile diseases ich may be imitated by the preparalytic stage of polio-elitis: pneumonia, tonsillitis, influenza, otitis media, elitis, the exanthemata, dysentery, sunstroke, and laria. This group has caused the greatest difficulty. Cases in which poliomyelitis is suspected because of e inability to use a limb or because of the development of imp, the actual cause being: injury, acute rheumatism, uinal adenitis, scurvy, syphilitic para-epiphysitis, osteo-elitis, hysteria, peripheral neuritis, lead poisoning, htheritic paralysis, tetany, erythrœdema, spinal cord mours, or lesions of cerebral vessels.

(b) The group in which examination of the cerebro-spinal id is required: meningitis, tuberculous, cerebro-spinal, [illegible] streptococcal, staphylococcal, or influenzal; [illegible] complications of typhoid or parotitis, sub-arachnoid hæmorrhage, tetanus, uræmia, ningo-vascular syphilis, encephalitis following varicella vaccinia, encephalitis lethargica.

It has been strongly emphasised that even in mes of epidemic, in the absence of definite indication, mbar puncture for diagnostic purposes in cases of ute illness is not justifiable, but that every patient ffering from an illness for which a definite cause nnot be found by careful clinical examination ould be carefully watched and frequently -examined in order to detect the first evidence of eningeal involvement, when one still has time to nfirm the diagnosis by examination of the fluid d time to administer serum. It has been shown by yon [12] that cytolysis occurs in the cerebro-spinal uid if the fluid is allowed to stand after withdrawal, d that this cytolysis is selective, destroying the lymorphonuclear elements more rapidly than the ononuclear cells. For this reason and for the other at the treatment of preparalytic poliomyelitis is urgent matter, comparable to that of a ruptured topic gestation or intussusception, arrangements ould be made for examination of fluid at the bedside. he procedure adopted has been as follows :—

A careful clinical examination having failed to reveal y other cause for the illness, consideration of the gns and symptoms leading one to make a clinical agnosis of poliomyelitis, it is decided to carry out mbar puncture. The microscope and counting amber are placed in readiness, together with the agents for the Nonne-Apelt and Pandy's tests and luidin-blue solution. The needle is inserted, a w c.cm. of fluid are withdrawn, and the stillette is inserted and kept in position while the fluid is amined. If the cells be not increased the needle is en withdrawn. If the cells are increased, they are ained with toluidin-blue and the number of poly-orphonuclear and mononuclear cells counted. If e history has led to the suspicion of tuberculous eningitis, the chloride content of the fluid is esti-ated, for in poliomyelitis this is not reduced. If he fluid findings confirm the clinical diagnosis, the tillette is then withdrawn, fluid is allowed to escape, nd a slightly smaller quantity of warmed serum is lowly administered intrathecally by attachment of ubing and funnel to the lumbar puncture needle.

Thus the one anæsthetic which may be necessary n a child is sufficient for diagnostic lumbar puncture, ntrathecal and intravenous injections.

The findings in the cerebro-spinal fluid vary at different stages of the disease, and this variation is pathognomonic of preparalytic poliomyelitis. Early in the preparalytic stage the polymorphonuclear cells are increased, but they disappear as the lymphocytes increase until, at the stage of paralysis, only 5 per cent. to 10 per cent. of cells are polymorphonuclear. Globulin appears late in the preparalytic stage, and does not reach its highest concentration until paralysis has occurred, and it persists after the cell count has returned to normal. Details of the findings of the cerebro-spinal fluids examined will be found later in the case records (Table III.).

Dosage.

Increasing experience has impressed upon us the importance of an adequate initial dose of serum. By administration of a product containing proven viricidal properties, one attempts to give the patient a passive immunity, but the time factor is all important. Untreated, the majority of cases develop an immunity for themselves within the next few days; but during that period damage may be done to the nerve-cells which will alter the whole life of the patient. If therapy is to be effective, the virus must be inactivated by the viricidal properties of the serum and the disease cut short before the nerve-cells die. For this reason one cannot afford to delay between withdrawal of fluid and administration of serum while the fluid is sent to a laboratory for examination. Secondly, it appears unreasonable when the patient's future may depend on the race between development of passive immunity and the death of anterior horn cells, to administer serum intramuscularly or sub-cutaneously. Thirdly, it is imperative that the product used should possess as high a titre of viricidal properties as it is possible to obtain.

Aycock [14] and others [13] have demonstrated that serum of certain normal adults possesses viricidal properties, possibly developed during a subclinical infection. The only method of distinguishing those persons whose sera is so effective is by testing the power of individual specimens of sera to neutralise virus in vitro before innoculation of the serum-virus mixture into the brain of a monkey.

In most diseases the administration of inactive serum is not likely to cause positive harm; but in poliomyelitis the injection of inert serum may actually tend to promote paralysis. Flexner and Amoss [15] have shown that in monkeys who have received poliomyelitis virus intravenously, intranasally, or subcutaneously, the introduction of aseptic normal serum will promote invasion of the central nervous system. The condition of these monkeys is closely analogous to that of children in the preparalytic stage. Moreover, Schultz [16] has demonstrated that the time taken for immune serum to neutralise virus varies with the concentration of the serum—dilution delaying inactivation of virus. Our clinical experience has impressed upon us the brevity of the interval between the phase at which recognition of the disease is possible and the latest moment at which an injection of potent serum will avert paralysis. This fact, together with the reasons discussed—(1) the possibility of causing positive harm, (2) the certainty of delay in neutralisation of virus by dilution of any active serum which may be present by inert components—has led us to oppose the suggestion to use pooled normal human serum, of which the whole or part may be lacking in viricidal properties. By the after-care of all potential donors it has been possible to obtain adequate supplies of immune serum, and different epidemics in different localities. This step was taken after experimental work with monkeys by Burnet and Macnamara[4] which, within the limitations of the tests employed, indicated that serum from cases affected three to five years previously possessed viricidal properties equal to that of more recent cases In the course of this work evidence was obtained[5] that more than one strain of virus may exist which suggested the policy of pooling sera from many individuals.

During the period under review, 1925 to 1931, 83 persons have given blood in a total of 201 bleedings: 39 were bled once only; 11, twice; 17, three times; 8, four times; 3, five times; 1, six times; 2, seven times; and 2, nine times.

The time which elapsed between the onset of the disease and the withdrawal of blood for the preparation of serum was:—

	Instances.		Instances.
Under 1 year ..	86	Between—	
Between—		6 and 7 years ..	3
1 and 2 years ..	32	7 ,, 8 ,, ..	2
2 ,, 3 ,, ..	32	8 ,, 9 ,, ..	1
3 ,, 4 ,, ..	7	10 years and over ..	21
4 ,, 5 ,, ..	7		
5 ,, 6 ,, ..	10	Total	201

The product obtained has the following advantages. Though free from antiseptic, it can be stored at ice-box temperature and used with safety after several years, the viricidal properties being retained. A minimum of hæmolysis has occurred, and secondary formation of fibrin has been absent. In the literature[6] one reads of reactions occurring following the injection intravenously and intrathecally of human serum. In the 260 patients to whom serum has been administered in Victoria, no unpleasant reaction has occurred, and it is suggested that while the reason may be the freedom from hæmolysis and from added antiseptic, another explanation may be that removal of fibrinogen during clotting produced by the addition of calcium chloride is more complete than that which occurs when blood is allowed to clot naturally.

Use of Serum.

Victoria has an area of 87,884 square miles and a population of 1,777,065, of whom 1,036,630 live in the capital city, Melbourne. The incidence of poliomyelitis in Victoria since this work has been undertaken has been as follows:—

November, 1924, to November, 1925	134
,, 1925, ,, ,, 1926	—
,, 1926, ,, ,, 1927	6
,, 1927, ,, ,, 1928	182
,, 1928, ,, ,, 1929	157
,, 1929, ,, ,, 1930	97
,, 1930, ,, Aug. 18th, 1931	297
Total	873

In 1925 only one case was diagnosed before paralysis. Serum was administered to 12 patients after paralysis had been present for some days. These cases have been examined regularly, and their progress noted and compared with that of others with similar initial paralysis among the group of cases who did not receive serum. The degree and rate of recovery of power in the serum cases was no better than that of the controls who received identical after-treatment, and we soon realised that it was not justifiable to administer expensive serum to afebrile patients after paralysis had been present for some days. Education of the profession and the interest of the public resulted in an increase in the proportion of cases diagnosed before paralysis, until, in 1931, of 270 cases, 86 were treated in the preparalytic stage.

The Preparalytic Stage.

The type of case with fulminating onset has been exceedingly rare. The mode of onset has been either the straggling or dromedary types described by Draper.[7] In the former the illness has lasted from two to seven days; in the latter a period up to 14 days, which include an intermission of apparent recovery. The usual story in this type is one of two or three days' indefinite illness, fever, vomiting, drowsiness, and lassitude, then improvement for a period in which the child may resume attendance at school followed by a second phase of illness, which after 24–48 hours is followed by paralysis.

The syndrome of the preparalytic stage can be recognised. It varies slightly in different age-groups, in babies under 12 months, in children and in adults, in different epidemics, in different phases of one epidemic and in different parts of the country, but our experience has confirmed that of American[9] and New Zealand[10] observers—that it is possible to be reasonably certain of the diagnosis by clinical examination before seeking the confirmation of cerebro-spinal fluid findings. Fever is usually present; it is rarely high in the early weeks of an epidemic, though temperatures of 103°–104° F. often occur during the peak months. In adults the temperature may be no higher than 100° F. (37·8° C.). Headache is a common complaint of older children, and in adults may be severe. Drowsiness when left alone and irritability when disturbed is a common story of the parent, but the irritability has differed from that of children with meningitis. If time and patience and gentleness be given to the examination, and the child reassured, the usual finding is one of intelligent coöperation. Pain in the neck or between the shoulder-blades is frequent. Pain may be referred to a limb which will later become hyperæsthetic. Vomiting once has been the usual story. Convulsions rarely occur, and persistent convulsions suggest another diagnosis. Photophobia, retention of urine, localised sweating, tremor of the hands do not occur in every case, but any one of these symptoms is a valuable warning. Constipation is usual.

SPINE SIGN.

The most valuable sign has been the spine sign. By this is meant disinclination to flex the spine anteriorly because of the pain involved by the movement. Although spinal rigidity of a degree comparable to the opisthotonus of tetanus or cerebro-spinal meningitis may occur in preparalytic poliomyelitis, if one expects head retraction of that degree, the majority of cases will be missed.

The spine sign must be deliberately elicited. It is not wise to try to elicit it with the child in a recumbent position by placing the hand under the head and bringing the head forward. Almost any febrile child resents that handling. If the fever is not high, take the child from the bed, place him in the sitting position, or nurse him comfortably in the arms and gently persuade him to kiss his knee. The child attempts to carry out the movement and gives up "because it hurts" either at the back of the neck, between the shoulders, or in the hamstrings, or in some cases throughout the whole length of the back. In order to obtain his coöperation bribe him with a penny as a prize if the lips meet the knee. Even with help by passive movement, if a spine sign be present the child, though anxious for the penny, cannot earn it. In adults or in children when fever is high, carry out the test with the patient lying on his side, and passively flex the spine as far as the patient will allow. In babies, one has to rely on passive flexion in order to estimate the amount of pain caused by the movement.

Amoss's sign, though not invariably present, can often be elicited. When the child is placed in the sitting position on a firm chair or table, the position assumed is that of a tripod, the child using both arms to support part of the body-weight and to throw

THE LANCET COMMISSION ON NURSING.

(Continued from p. 417.)

HE second section of the Final Report is itled the

Evolution of British Nursing.

early history of nursing, from the institution of Deaconesses in the first century A.D. and the er of Women Clergy, the Widows, and Deaconesses gnised by the Church in the IVth and following turies, is traced through the mediæval develop- its to the phase when the military orders had r origin in the events of the Second Crusade. date of the foundation of the Knights Hospitallers St. John of Jerusalem is 1100, and an interesting er, the Béguines, was almost contemporary in its h at Liége. Many religious and secular Orders e in France, Italy, and Germany during the next e centuries, but the practice of nursing received ll impetus from them.

n the XVIIth century Vincent de Paul founded Sisters of Charity, but their functions were ricted, and a general decline in nursing marked XVIIth and XVIIIth centuries, the evil times g protracted until the middle of the XIXth tury. Nursing as a calling was at its lowest level the beginning of the XIXth century, nowhere ing shared in the general development of social nities. In 1822 the Kaiserswerth movement luded real advance.

t the beginning of the XIXth century there was no anised nursing in this country, and an awakening the public conscience did not come until some years after the Kaiserswerth example had been set.

Details are given in the Report of the plight of tain London hospitals at this time. Until as late 1840 many of the women hired to nurse in hospitals e given such low wages that no preliminary inquiry their character was convenient, and it is not prising that we read of charges brought against m of unchastity, drunkenness, bad language, and ering. The quality and quantity of their food- ply and their sleeping accommodation, when vided within the walls, was often disgraceful. s not the failings of women placed in such circum- nces that should be wondered at, but their virtues. e life of many of them was a record of self-sacrifice. ey could only render such help as they were npetent for, and in the dismal situation it is comfort- to recollect that the technique required of them s no more than the rendering of domestic duties in l and sometimes revolting circumstances. The ition of being regarded as a good nurse was attained en a woman, through experience, obtained a owledge of how to dress wounds and how to relieve n by suitable applications and by changes of sture. A certain number of nurses would learn to erpret symptomatic troubles, and so to gauge e seriousness of a case. The qualities of such women re perceived by the medical staff, but were other- se unrecognised. The depressing attitude of those ponsible for the management of the institutions s that, in such surroundings, only those nurses ed be expected whose standards were in accord th the environment.

Early efforts at reform are described, the institution the British Nursing Orders, and finally the grand volution in nursing that came with the Crimean War, and the modern developments of Florence Nightingale's pioneer work.

Modern Times.

These developments, says the final paragraph of this section of the Report, have produced a service of nursing working successfully in institutions from which every vestige of the ancient horrors has disappeared. But these horrors once existed, and certain of them could only have been eradicated by the presence of women who were known to have definitely renounced worldly aims, dedicating themselves to an austere life under rigid discipline, the discipline being enjoined partly at least to protect young women from slander and to satisfy parents of their safety. Their submission to or acceptance of the strict conditions laid down had a productive result, for standards of decency and of equipment in hospitals were quickly raised. All this must be remembered when the traditional hospital training is criticised. If the machinery has been altered too slowly to correspond with modern requirements, its pattern was at one time admirably appropriate, even essential, to the work which had to be done. It is because the impetus towards an exclusively vocational ideal has been so fervent and so lasting, that even now some hold the outlook of the young professional woman of these times to be incompatible with the practice of nursing.

To-day, with the progress of medicine, the degree of coöperation required by the doctor from the nurse has increased, and has made necessary certain changes bringing with them a need of developing qualities of discretion, resourcefulness, and scientific observation in the student nurse. Experience has shown that these may be cultivated without sacrifice of the vocational ideal, though the discipline which fosters them may be of a somewhat different order than that enjoined by tradition.

The whole of Section III. of the Report on the present position of nursing is set out in full below.

The Present Position.

The establishment in 1919 of the General Nursing Councils gave nursing a definite professional status. Certain hospitals only were approved as training schools, and a standard curriculum was instituted, leading up to examinations for admission to State registers. Unfortunately these developments have not been effective in increasing the popularity of nursing as a profession for educated women, although, during the last 12 years, other professions and occupations open to women have become increasingly crowded.

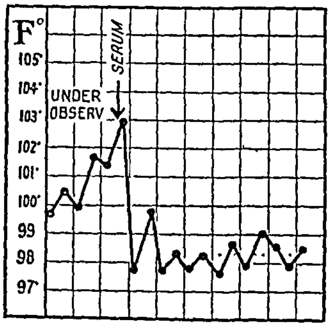
THE BARRIER TO COÖPERATION.

The nurse's conditions of training and service have fallen into relative disfavour not only with young people in search of a career, but also with their advisers, and with women in other professions. On the other hand, nurses themselves are distressed and even indignant at what they regard as an undeserved prejudice against hospital life.

The nursing profession as a whole tends to view the conditions of service and training now available in the light of those offered in the past, even as recently as ten years ago, and finds them immeasurably more favourable; whereas women in other professions, and girls debating their future career, are apt to brush aside as irrelevant any description of past conditions, and to survey hospital life as it actually is to-day, detached from its background of fine tradition. The divergence of outlook forms a barrier, the more formidable because it has not been openly acknowledged, therefore it has not been necessary to carry out the preliminary testing of specimens of normal sera which alone would justify its use.

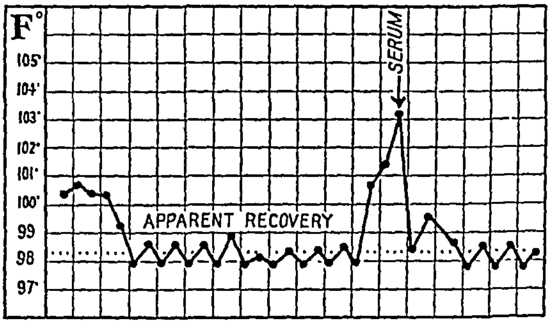
In estimating the dose of serum required, one takes into consideration the following points: the age and size of the patient, the degree of toxæmia, the stage of the epidemic, and the duration of his illness, particularly the duration of the signs of meningeal involvement and the cerebro-spinal fluid findings. A patient in whom a history is obtained of illness eight to four days previously, followed by an interval of apparent recovery lasting for two to three days, followed by the second phase of his illness with pain in the neck and back, fever, and a spine sign lasting over 24 hours, has little time to lose. The development of tremor and hyperæsthesia suggests that already some involvement of motor cells and sensory ganglia has occurred. These symptoms call for a larger dose than that which should be given to a patient who has developed a spine sign within the last six hours after two days of observation.

FIG. 1.



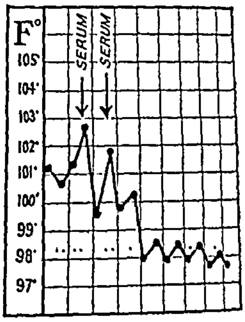
Satisfactory response to injection of serum.

FIG. 2.



Dromedary type of onset. Satisfactory response to injection of serum.

FIG. 3.



Unsatisfactory response to first injection. Second dose was required and given. Response was satisfactory.

The type of cell found in the fluid is of assistance in estimating the dose required. When almost all the cells are lymphocytes, paralysis is not far off, and therefore the dose should be increased.

The initial dose of serum used has been rarely less than 50 c.cm. After the cerebro-spinal fluid has been allowed to escape, a slightly smaller quantity of serum is administered intrathecally, and the remainder of the dose administered intravenously, even though venesection may be necessary. The patient should be carefully re-examined 12, 18, and 24 hours later. If the dose has been adequate, though spinal rigidity will persist, the temperature should have fallen, and the general condition be greatly improved (Figs. 1 and 2). During the interval other confusing factors should be eliminated. These patients are usually constipated, dehydrated, and slightly acidotic, the pain in the neck having prevented ingestion of fluid. After administration of serum, a brisk aperient should be given, and carbohydrate and fluid administered freely by means of a spoon or bent glass tube or feeding-cup, which will save the patient the discomfort of flexion of the neck.

If improvement is not marked within 18 hours, we have considered that an insufficient dose has been given, and a further 30 to 40 c.cm. has been injected intravenously (Fig. 3). The failures in the series have taught us the importance of this examination 12, 18, and 24 hours after the first, and have influenced us in omitting antiseptic from the serum. If, 12 to 18 hours after injection of a product containing antiseptic, fibrinogen, or hæmolysed red cells, the temperature is still elevated, the patient still miserable, complaining of headache, perhaps vomiting, one cannot estimate how much to attribute to reaction to the therapy and how much is due to insufficient dosage. The use of a non-irritating serum does not cause confusion at this important stage. In our series, if the patient had not improved within 20 hours, there has been one reason only—insufficient dosage.

While experimental work on the production of immune sera by the inoculation of horses with filtrates and suspensions of the spinal cords of monkeys infected by poliomyelitis virus[17] may in the future lead to the production of serum of therapeutic value, it would appear that the reactions at present induced by injections of horse serum are, in this disease, a serious disadvantage.

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(To be continued.)

SUSSEX PROVIDENT SCHEME.—The sum of £17,537 was distributed among the coöperating hospitals under this scheme during 1931. Inaugurated in 1921, when only £332 was distributed, the amount has increased each year, and local hospitals have received over £90,000. In the allocation for 1931, the Royal Sussex County Hospital, Brighton, received £6806; the Royal Alexandra Hospital for Sick Children, Brighton, £2199; the New Sussex Hospital, £1554; and Hove Hospital, £1052. Other substantial allocations included Haywards Heath Hospital, £981; Sussex Eye Hospital, £804; and Brighton Corporation, £662. Twenty-two other hospitals and kindred organisations as far afield as Hastings and St. Leonards, Horsham, and Arundel and Littlehampton also participated.

Fortunately, many matrons of important institutions now belong to this category, and they are doing much to bring hospital training into line with other forms of training; but their efforts are often hampered by the conservative attitude of valued members of their senior staffs. Ward sisters, especially those who have given their lives to hospital service without seeking administrative promotion, may be intolerant of attempts to induce them to allow to others a discipline less severe than that which they willingly impose on themselves. Their conception of vocation is high and rigid, and their attitude to the probationer is biased by their anxiety to preserve for the service of the hospital the whole of her available strength, vitality, and self-minded interest.

CRITICISM FROM WITHIN.

We have been fortunate in obtaining evidence on the training conditions in hospital from women who have reached high positions in the nursing world, after having previously trained for other professions. Their comments are illuminating, since they support those which have reached us from women's organisations outside the profession of nursing, such as the National Council of Women, the London and National Society for Women's Service, and the Association of Headmistresses. These comments may be summed up in the conclusion that the shortage of educated candidates is definitely related to the conditions of training offered by the hospitals, which are not even now catering intelligently for the type which they seek to enlist. The reference is not only, or even primarily, to conditions which have an economic basis, such as uncomfortable quarters or indifferent food, though reports of such conditions have a deterrent effect far beyond the range of the particular hospital guilty of such short-sighted negligence. The anomalies which especially worry the most desirable young nurse and her friends may coexist with a luxurious Nurses' Home and an excellent dietary.

RESPONSIBILITY WITHOUT TRUST.

The most noticeable of these anomalies, and one which really includes all the rest, is the contrast between the degree of responsibility assigned to the probationer in the wards and the degree of confidence reposed in her in the Nurses' Home. While still a student she may be left at night in sole charge of a ward of sick people, or be detailed to wash, tend, and report on the changing condition of a critically ill patient. Though she is given such serious and responsible duties, the amount of discretion allowed her in the conduct of her personal affairs, that is, in the organisation of that part of the 24 hours when she is not on duty, is very small. For example, she is usually obliged to attend all the principal meals, even when they are adjacent to off-duty hours. She must be in her room at 10 P.M. and her lights must be out at 10.30 P.M. She may not, as a rule, leave the hospital between 8 P.M., when she comes off duty, and bedtime, except by special permission. The reasons generally given for such restrictions are that the matron is responsible to the probationer's parents for seeing that she gets sufficient rest and food, and that her evenings are devoted to study. This degree of supervision was doubtless welcomed by parents when it corresponded closely with that exercised in middle-class homes; but we have ample evidence that it can no longer be held to reflect their wishes.

In any case, the fact that in most hospitals the same regulations are applied even to nurses no longer in training suggests that considerations other than a responsibility for the young beginner are involved. It is not disputed by anyone that in view of the long span of the nurse's working day, and of the arduous nature of her duties, she must, if breakdown is to be avoided, lead a life more regular and austere than need be adopted by those doing other work. The change in outlook that hospital authorities have not yet recognised is that the modern girl does not admit the propriety of any attempt to ensure her efficiency as an employee by regulation of her private life. If she cares to miss an occasional meal, or to spend her evenings at her home or at some entertainment, or to read late, it is her own business; if she is unpunctual at her work, or slack in the performance of her duties, her employers have an easy remedy in a threat of dismissal. But it is for her, she holds, and not for them to regulate her life in accordance with the work she has undertaken, and the assumption that she needs protective supervision she finds quite unacceptable.

THE TRADITIONAL OUTLOOK AND THE MODERN OUTLOOK.

It is clear that basic differences between the traditional and the modern outlook on women's work and aspirations have here to be recognised and reconciled. It has been suggested to us that differentiation between the regulations applying to trained and to untrained staff in hospitals might provide a useful, though possibly only a temporary, bridge between the two outlooks. If the prospect of escaping from a protective environment after State registration encouraged educated girls to enter hospitals, the emancipation of probationers would follow. At present the fear that they will be treated as children deters well-educated girls from taking up nursing. But until a better type of candidate presents herself, it is not surprising that the hospitals should continue to treat probationers as children, since many of them have not been trained to self-government before entering hospital. When after three years this training is completed, however, and the nurse is deemed fit to be sent out into the world as a State-registered nurse, she should also be fit to be trusted to regulate her own life in hospital outside working hours. Action which indicated acceptance of this point of view might do more, perhaps, than any other single step to re-establish confidence between women within and without the hospitals, and might serve to secure the coöperation of all sections of the community in attempts to restore nursing to its former position in the esteem of educated women. *(To be continued.)*

VIENNA.

(FROM OUR OWN CORRESPONDENT.)

VACCINATION IN VIENNA.

IN this country vaccination against small-pox is not strictly compulsory, but indirect coercion is exercised by regulations which stipulate that eligibility for certain appointments or situations, admission to all kinds of higher schools or institutions, to official posts, and to public offices, and even the award of prizes is dependent on production of a certificate of successful vaccination. When there is an epidemic of small-pox revaccination and primary vaccination may be enforced by an "ambulant vaccination officer" (Public Health Act of 1840). In a publication by the Vienna Board of Health, covering the last ten years (1919–1929) some interesting figures are given relating to first vaccinations and vaccination in schools. In 1919, 42,197 persons were reported which hampers free discussion between those within and those without the profession, and which must be broken down before sympathetic coöperation can be achieved. An atmosphere of tension and mutual misunderstanding has therefore grown up which it is difficult to dispel by argument.

MISCONCEPTIONS ON BOTH SIDES.

It is probably true that the prejudice against nursing which is undoubtedly present in the minds of parents, schoolmistresses, and young girls, is partly based on ignorance of the improvements which have been made in the conditions, accommodation, and amenities now offered to probationers in the best training hospitals. There is still a widespread belief that nurses in training are worked excessively hard, are allowed no freedom, are subject to unduly severe discipline. and are neither fed well nor lodged comfortably. A girl to whom nursing is proposed as a career envisages a period of three years at least of drudgery, during which time she will be cut off from her friends, her games, and her social amusements, will be always overtired physically, and often snubbed and reproved. Reiterated assurances that this dark picture no longer represents—if it ever did represent—hospital life do not serve to obliterate it. It will fade completely only when it is patently untrue to life in every hospital in the country, for its colours are constantly being revived by reports from probationers who have not been fortunate in their selection of a training school. Further, general recognition of improvements in conditions has been delayed not only by a lack of uniformity in their adoption, but also by a reluctance on the part of hospitals to give wide publicity to such changes, with the implied admission that they were necessary or even overdue. It is therefore not remarkable that misconceptions still obtain. The clear picture of present-day hospital life provided by our Second Interim Report (see Appendix XVIII.) should do much to remove them. It also shows that the conditions which gave rise to prejudice in the past have not been wholly eliminated.

"WHAT MORE DO THEY WANT?"

Senior nurses who have watched with amazement, and not always with approval, the improvement in the conditions offered to probationers during recent years, express themselves at a loss to understand why girls are not attracted to this work in large numbers. When faced with a shortage they ask: "What more do they want?" The recital of what they do want, or what their parents, headmistresses, or sisters in other professions want for them, is, however, likely to be coldly received. It may even be resented as criticism of a system which tradition has made sacred, and which has admittedly produced nurses unsurpassed throughout the world for perception, skill, and sense of responsibility.

How can a better understanding be brought about? The first essential is a candid exploration of the issues involved, and a determination to find common ground. The basis of this common ground must be the recognition on both sides that while a professional organisation has been superimposed on a system of apprenticeship, this system is valued not only because it is sanctioned by tradition, but for its own sake.

THE VALUE PLACED ON ROUTINE.

The element of apprenticeship is regarded by most of the leaders of the nursing profession, at least in this country, as a far more important part of a nurse's training than her theoretical studies. Some senior nurses, notably ward sisters, may still be heard to protest that the vocational spirit which inspired former generations of nurses has been dimmed by the introduction of a standard curriculum. Although most of them are now beginning to realise that their early fears in this respect were unfounded, they attribute the preservation of the vocational spirit to the retention of a factor in hospital life which has been severely criticised from outside the profession, and is stated to have prevented many girls from entering hospitals. This factor is the routine work of the probationer, occupying nine to ten hours a day. It has not been modified to give her more time and leisure for study; and though the passing of State examinations is now essential to her career, she must fit in her theoretical work and at least some of her lectures during her official off-duty time.

Women in other professions are apt to regard such long hours of routine work, the restrictions on liberty when off duty, in short, the scanty opportunity given to the nurse in training to lead a normal social life and to cultivate interests apart from her work, as being associated mainly with the desire of the hospitals to economise at the expense of their staff. They criticise senior nurses for acquiescing without protest in a system which admits of the exploitation of student labour. But they fail to recognise that a large section of the nursing profession, especially ward sisters, remain convinced of the value of a strict discipline, which is designed to plant and foster in the probationer certain qualities and habits. Among these are uncritical obedience; punctuality; loyalty to superiors and to the institution served; together with a sense of responsibility and of vocation which, in the opinion of many, is incompatible with the cultivation and maintenance of wide interests outside the hospital community.

A CONFLICT OF IDEALS.

It is this attitude which underlies the disregard of the mental conflict that may trouble a probationer who comes from a good secondary school; there her duty has been primarily to learn, her critical faculty has been stimulated, and her practical work has been assessed for precision and neatness and a grasp of principle, rather than for a speed of execution which to a beginner is incompatible with a high standard of efficiency. She soon learns in hospital that her first duty is to help to get the work done, and in some hospitals she must also learn to subdue her critical impulses and even her curiosity. It is assumed that she will never make a good nurse unless she regards her time as the hospital's and not her own, and her training as incidental to the work she does as employee. A receptive young nurse soon absorbs this spirit, and is in her turn shocked at the solecisms and breaches of etiquette committed by newcomers. But in the process of acclimatisation she is liable to adopt blindly the traditions of her seniors—the reaction has been aptly described as "putting on the blinkers"—and to become as impervious as they are to the fact that the educational methods practised in hospitals have been largely superseded elsewhere by methods which rely on arousing, instead of damping, curiosity and initiative, and which insist on the importance of developing a student's personality and tastes outside the range of daily work.

It is only the exceptional nurse, that is, one who has maintained close touch with the social and educational tendencies of the day, who is able to discern which of the peculiarities of hospital life are essential to its structure, and which are mere survivals from a different age, and could safely be jettisoned.

best gladiatorial spirit. The esteem in which one side is held by the other can, perhaps, be measured in less vivid terms than was the case only a few generations ago; but there still remains a strong tendency to score debating points rather than more solid advantages. This correspondence might, in fact, have ended in the usual stalemate, had not a practical suggestion been made by a doctor holding a hospital appointment. Dr. Weismann-Netter, of the Saint-Antoine Hospital, has invited his homœopath colleagues to treat patients in his hospital, his only stipulation being that the guests contribute the same good faith to the proposed tests that the host himself guarantees. In this way he hopes to test such homœopathic claims as that Jenner's vaccine, given by the mouth in homœopathic doses, confers specific immunity on the person concerned; and that a Wassermann reaction which has hitherto persisted in being positive, becomes negative on the administration of the homœopathic "syphilinum." Assuredly this invitation is bona fide. Will it be accepted? A year or two hence we may, perhaps, have some interesting results to report.

UNITED STATES OF AMERICA.

(FROM AN OCCASIONAL CORRESPONDENT.)

SCHOOL VENTILATION.

THE publication of the final report of the New York Commission on Ventilation [1] is an event of significance partly because of the great amount of research which lies behind it and partly because of the strenuous protests that the earlier conclusions of the distinguished committee have aroused. Ventilating engineers have loudly demanded definite specifications for construction. The committee has throughout preferred to stress desirable conditions of temperature, humidity, and air movement. In an earlier report they had, however, concluded that "window gravity ventilation is definitely superior to plenum ventilation." This conclusion, all the more startling since several of the States had written "plenum" into their school building codes, raised a storm of indignation among the engineers and is now definitely withdrawn. "Desirable air conditions," the present report states, "may be obtained . . . (*a*) by plenum ventilation; (*b*) by local unit ventilation; (*c*) by window gravity ventilation."

The commission recommends a model law as follows:

1. The major objectives of schoolroom ventilation shall be the elimination of heat from the body surface without the production of objectionable draughts. This means the maintainance of a room temperature of 65° F. in corridors, gymnasiums, and shops; of 75° F. in swimming pools and adjacent dressing rooms; and of 68° F. in all other occupied rooms.

2. The avoidance of overheating is of primary importance for the promotion of comfort and efficiency, and the maintenance of resistance against disease. Sources of direct radiation, therefore, shall be so designed or protected as to prevent overheating of persons in adjacent seats.

3. All classrooms shall have at least 15 square feet of floor space and 200 cubic feet of air space per pupil, and shall have a system of heating and ventilation which shall provide means of air supply and exhaust capable of avoiding unpleasant odours, and of avoiding, without chilling draughts, an increase of room temperature above 68° F.

4. Such ventilation shall be accomplished by any means which will attain satisfactorily these specified results. For the average school, favourably located, window gravity (open window) ventilation seems to be the method of choice on grounds of comfort and economy.

5. Every schoolroom used for instruction, study, assembly, and physical recreation shall be provided with at least one thermometer of a grade that will give a reading accurate to within one degree F. The thermometer should be so located as to give a representative reading of temperature at the breathing plane of the pupils.

Engineers would be required to submit for approval by either the State Board of Education or the State Board of Health plans which in their judgment would provide the above conditions. Such an arrangement, the commission points out, is on all fours with present regulations governing water-supply and waste disposal.

This 1931 report should be read as an addendum to the exhaustive report published in 1923.

FEDERAL GRANTS IN AID OF HEALTH WORK.

The old battle concerning Federal subsidy to the States for health which ended in 1929 with the lapsing of the Sheppard-Towner Maternity and Infancy Act of 1921 is about to be resumed in Congress. Three Bills have been introduced which substantially renew the conditions of the former Act, but add thereto provisions for subsidies in aid of schemes for rural public health work which must be approved by a "Federal Health Coördinating Board." In the lobby for these Bills will be the powerful organisations of the women voters as well as the State health authorities. In the opposite lobby is found the medical profession, or at least its articulate representatives, with many arguments [2] inspired by the fear of that monster "State medicine" before the thought of which almost all American physicians still recoil in horror. The main chance of defeating the Bills lies in the present need for national economy. H.R. 7525, introduced by Representative Bankhead of Alabama, having been recommended in committee, is already on the calendar of the House of Representatives. It calls for appropriations increasing from two and a quarter million dollars in the present year to four and a quarter million dollars in 1937 and subsequent years. This is a small sum in comparison with demands made by other Bills for unemployment relief and naval replacements, and yet the President's appeal for stringent economy will have to be considered.

As regards the success of the old Sheppard-Towner Act, Miss Grace Abbott, chief of the Children's Bureau, states that "no State department of health developed what could be called a maternal hygiene programme until after the passage of the Maternity and Infancy Act in November, 1921. At the time when the benefits of the Act came to an end on June 30th, 1929, every State except Vermont had such a division or bureau functioning in the field of maternal and child hygiene and the Department of Health of Vermont . . . had inaugurated an educational programme in maternal and child care." In contrast to this statement place that found in the editorial above mentioned, "A considerable number of states did not appropriate for maternal hygiene up to their full financial ability until after the repeal of the Sheppard-Towner Act. Apparently federal aid has a deadening effect on State initiative!" Miss Abbott gives in detail statistics for the registration states of 1921 showing a decline in infant mortality from 75·0 in 1921 to 65·7 in 1929, and of maternal mortality from 67·3 (per 10,000 live births) in 1921 to 63·7 in 1929. The editorial in the Journal of the American Medical Association, though it gives no statistics, states that the operation of the Act "did not accelerate the rate of decline in either the maternal or the infant death-rates by even a fraction of a point per annum." And so the battle is waged.

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[1] School Ventilation: Principles and Practices. Pub. Bureau of Publications, Teachers' College, Columbia University, N.Y.C. 1931. Pp. 67. $1.

[2] See editorial, Jour. Amer. Med. Assoc., Jan. 30th, p. 401.

by the medical practitioners and by the public vaccinators as having applied for vaccination. Of these, 9165 were vaccinated for the first time, and 17,544 were school-children. The figures for the following years are as follows :—

Year.	Total vaccinated.	First vaccinations, including school-children.	Vaccination of school-children, including revaccination.
1920 ..	38,691	8,993	18,329
1921 ..	41,890	8,291	28,681
1923 ..	44,483	10,240	28,293
1924 ..	38,836	10,569	22,668
1925 ..	28,110	11,103	20,293
1926 ..	28,079	14,960	25,712
1927 ..	33,304	15,110	24,548
1929 ..	44,113	17,958	28,114

The figures for the years 1922 and 1928 are not included in this compilation, for they require confirmation. But it is quite clear that during the last few years almost the entire population of this city may be regarded as being under the effect of prophylactic vaccination. The result is that for some four years there has not been a single case of small-pox in Vienna.

THE TITLE OF SPECIALIST.

In a report presented to the Vienna Aerztekammer (medical board), Dr. Sonnenfeld discusses the present state of regulations concerning the title of "Facharzt" or specialist. It is perhaps surprising that at present there is no legal definition. Any medical man may call himself a specialist in any particular branch of medicine or surgery he chooses. Only, if he wants to take part in contract practice, as arranged between the sick-clubs and the representative board of the medical profession (Wirthschaftliche Organisation der Aerzte), he must comply with the regulations and submit to the restrictions arranged between these two parties. A would-be specialist must show proof that he has studied for at least four years, after graduation as M.D., in an institution or clinic devoted solely to his specialty. Then he must become a member of one of the 14 groups of specialists dealing with surgery, dermatology, gynæcology (including obstetrics), internal medicine, respiratory disease, neurology and psychiatry, ophthalmology, orthopædics, oto-rhino-laryngology, pædiatrics, physico-therapeutics, röntgenology, urology, and medical laboratory work. For the surgical branches, the applicant should show evidence of post-graduate study for not less than five years, and he must satisfy the board that he has been working quite independently —i.e., as fully qualified assistant or locum tenent in the special wards or departments. This holds good for Vienna. In the provinces the applicant for the title of specialist must satisfy the official medical board of his specialist studies, if he wishes to take part in contract practice. Otherwise he is bound in no way to any consent on the part of medical corporations or bodies. In Vienna, the specialist may only practise in one of the 14 above-mentioned groups; in the provinces he may combine two or more groups. But, I repeat, this is only a private arrangement between the two organisations. Even in Vienna a man restricting himself to private practice may combine whatever specialties he wishes. The public, however, is so used to regarding only the properly qualified man as Facharzt that in practice the regulations sketched above are valid for all specialists, for there are hardly any medical men practising who do not, in one way or other, come under the scope of the contract arrangement mentioned before. Only for one group of specialists do we provide legal protection—namely, dental surgeons. The title of Zahnarzt may be used only by a duly qualified medical man, who, after having taken his M.D. degree, has worked for two years in the dental clinic and restricts his practice to the diseases of the teeth and mouth arising from dental troubles. At present there are in Vienna about 1200 specialists and 600 dental surgeons, out of a total of about 3600 practitioners.

PARIS.

(FROM OUR OWN CORRESPONDENT.)

BURIAL OF THE APPARENTLY DEAD.

A YEAR ago the Chamber of Deputies asked the Government to take the advice of the Academies of Medicine and Sciences in connexion with a reliable test of death, whose use would reduce to a minimum the number of premature burials. A commission of experts was appointed to deal with this matter, and on Feb. 2nd their report was presented to the Academy of Medicine. In the opinion of the members the risks of burial alive have been exaggerated, but in times of stress, war, epidemics, and the like, mistakes have been made, and whether the public's fear of premature burial be justified or not, the fact remains that this fear exists. Everything possible should therefore be done to remove not only the danger itself, but also the fear of it. The cases of mistaken death include those of hysterical lethargy in which general paralysis and anæsthesia are associated with retention of sensory perceptions. As circulation and respiration continue, the trained medical observer should not go astray. In other cases, under the influence of nervous shock, a condition arises similar to that of hibernating animals. This condition may end in death if energetic measures are not taken, and as it has been drily remarked, it is less important to make the diagnosis of death in such cases than to consider the prognosis and act accordingly. Syncope, again, is a condition in which a mistaken diagnosis of death may prove fatal, whether the patients have been hanged, drowned, gassed by carbon monoxide, poisoned by chloroform, or electrocuted. In the last-named state, syncope has been known to last for more than two hours. After describing the various tests and signs of death, and noting that little is yet known of Icard's test (intravenous injection of fluorescein, which discolours the conjunctivæ if blood is still circulating in the body) in connexion with the syncope of electrocution, the commission concludes that, after all, the most reliable sign of death is bleeding from a severed radial artery. The three main recommendations of the commission are (1) to wait at least 24 hours after death before burial, (2) not to bury anyone without a medical examination of the defunct, and (3) to put this medical examination, at any rate in the large towns, in the charge of doctors who have mastered the technique of the modern scientific tests of death. The commission envisages a system, according to which every person who is supposed to have died will be carefully examined for signs of respiration, circulation, &c., and the first manifestations of putrefaction, the doctor returning several hours later if he is in the slightest doubt.

HOMŒOPATH AND ALLOPATH.

The already lively pages of the *Siècle Médical* have recently been given an additional attraction by a homœopath-allopath correspondence conducted in the oy if he had been attended weekly by the doctor; hey replied that he had been seen weekly and hat they had no complaint to make. The regional fficer gave this unprejudiced evidence before the ommittee and the charge of wrongful certification was held not to be established.

An approved society complained that a National Health official certificate had been filled up incorrectly. The principal's assistant attended the patient's onfinement on August 16th, and he issued an intermediate certificate on August 19th, giving the cause of ncapacity as pregnancy. The doctor said this was written by mistake for puerperium. The giving of ny intermediate certificate was incorrect apart rom the clerical error. Sickness benefit ceases on confinement and the patient by her certificate of confinement becomes automatically entitled to four weeks maternity benefit and only after that time does sickness benefit begin again by the issue of a first certificate if the patient is still considered incapable of work. This doctor did not use the argument that as pregnancy was the cause of the confinement it was a correct term to use. Pregnancy is, however, a very well-known condition to lay people and it can hardly be correct to say that a woman is pregnant one week after her confinement. The matter is important to approved societies, for it may enable a patient to get sickness and maternity benefit at the same time unless great care is exercised in the supervision of certificates. The doctor was found guilty of a breach of the certification rules and was warned.

A patient visiting London consulted an insurance practitioner but did not claim treatment as an insured person. During the course of this treatment the doctor issued two National Health Insurance certificates, and at the end he submitted a private account, whereas official certificates must not be issued to patients who are being treated privately. The doctor agreed to withdraw the account and the committee accepted the statement that he had acted in good faith.

RECORDS.

Insurance practitioners are required under the terms of service to keep accurate records of work done on behalf of panel patients by entering details with clinical notes on the particular envelope (FMR), that belongs to each patient. Special payment for this clerical work was granted and included in the present capitation fee. This work is important in that proper notes help the doctor in the treatment of the case and are helpful to the next doctor attending should the patient move to another area. Moreover these entries provide statistics on which negotiations take place for the capitation fee. If no entries are made on these envelopes it appears that less work is being done than is really the case and it supports the argument that doctors are being overpaid for the work they do. An insurance practitioner was visited by a regional medical officer twice. On the first occasion there was no entry on 100 medical record envelopes (FMR); he was warned, and revisited some few months later when 549 cards had no entry from the period Feb. 15th to August 14th, 1931. The visitor asked the doctor to appear before his officers or write to say what explanation he had to offer but he did not write or appear. The sum of £5 was deducted from his next cheque.

AN ALLEGATION OF NEGLECT.

This case illustrates the necessity of straightforward dealing by a patient with his doctor or by the relatives when a doctor is attending. The mother of the deceased patient—a boy—failed to inform the doctor, when he called, either that a nurse had been called in to see the boy or that she had taken the boy's temperature and found it to be 104° F. The mother brought a charge of neglecting treatment in this case and she made allegations of drunkenness also against the doctor. The boy was sent to hospital by another doctor where he died from pneumonia. The mother's evidence was found to be unreliable in the matter of medicines, for she said only one bottle was given whereas the prescriptions which were dispensed showed he had had three bottles. The doctor was given the benefit of the doubt largely on the unreliability of the mother's evidence, but although the committee were satisfied that he was never in an intoxicated condition, a bad impression was created when it was admitted that he walked into the house and even into the bedroom smoking and he was advised when attending an ill patient, who (he said) was alone, to write down instructions that he wished carried out and not to leave it to the patient to remember to give to relatives when they returned.

CHARGING A FEE.

A mistress asked a doctor to see her maid and at the end of the consultation the maid handed her medical card to the doctor indicating thus that she was an insured person and therefore entitled to free treatment. Nevertheless the doctor charged 5s. He explained that he had given the consultation before the card was handed to him and that as the mistress had asked for the consultation she would pay the fee. Regulations provide that patients who (1) say they are insured or (2) who present a medical card (which is not signed by a doctor living within two miles) cannot be charged unless at the same time an official receipt is given which when forwarded to the insurance committee within 14 days enables them to obtain a refund if the insurance committee are satisfied they are entitled to free treatment. No receipt was tendered in this case. The medical service subcommittee is apt to deal severely with fee-snatching; but in this case it was satisfied that the doctor acted under a genuine misapprehension and he was only warned that it must not occur again.

SIZE OF PANEL.

Single-handed doctors are not permitted to be paid for more than 2500 panel patients. To receive payment for numbers over 2500, a doctor must employ a whole-time assistant and obtain the consent of the insurance committee. This doctor, having more than 2500 patients, with the consent of the committee engaged a whole-time assistant. The assistant subsequently left his service and the doctor was without an assistant from June 1st to Sept. 30th. He was only paid for 2500 patients for the quarter July to September and the committee decided to deduct £5 from his remuneration, representing the excess over 2500 for whom he had been paid for the month of June.

HOSPITAL COSTS.—In the last year of the guardians control the cost of the general hospital at Newcastle-on-Tyne was £43,258; the cost for the year ending March 31st, the first under civic control, is estimated at £52,700, which includes £6900 for special items mainly connected with the change-over. For the year ending March 31st, 1930, the medical staff numbered 10 (5 part time and 5 full time), for the current year the number is 18 (10 part time and 8 full time). The salaries have increased from £1789 to £3810. The average number of patients was 520 in 1930, and 526 for the current year. Last year Malmesbury cottage hospital admitted 370 patients, the weekly cost of whose maintenance averaged £2 10s., against £2 13s. 6d. in the previous year. At the Clayton Hospital, Wakefield, the average weekly cost (1969 patients) was £2 8s. 4d.

PANEL AND CONTRACT PRACTICE

Partners and Assistants.

NEWLY qualified men entering general practice should be aware of differences in the regulations under the Insurance Act for partners and assistants. For instance, whereas two partners may have a total of 5000 patients on their list, and one of them may have 3000 patients, a principal and assistant may only have 4000 patients. A partner to be recognised as such must receive at least one-third of the share of any other partner; when so recognised he can deputise for any other partner without the patient being able to demand the personal services of his own doctor. This is not so with an assistant. Here the patient can demand the personal service of the principal, which if available he must give, unless he has a reasonable explanation for his omission. In either case continuity of treatment must be provided. Again the principal must obtain the consent of the insurance committee for the employment of an assistant, but not to take in a partner. This consent which is only given from year to year cannot as the phrase runs "be unreasonably withheld"; if withheld the insurance committee must consult the panel committee, and in the event of disagreement the principal has the right of appeal to the Minister. Permission would not be given to employ more than one assistant without the consent of the Ministry.

THE PRINCIPAL'S RESPONSIBILITY.

For all the acts of his assistant the principal is responsible, and the insurance committee requires the assistant to join the panel list, so that he can be dealt with if necessary under the disciplinary machinery; but this does not prevent the principal from entering into an agreement of the usual restrictive type dealing with notice, payment, and the question of accepting insured persons on the list in his own name. Since an assistant may leave, depending upon the agreement (if any), at a week's, or a month's, or possibly a quarter's notice, has no capital in the practice, and usually receives a fixed salary, it is unusual for a principal to allow, or for an insurance committee to encourage, an assistant to accept names of patients on his own list, even if, under his agreement with his principal, he has to make arrangements for them to change upon his leaving the practice. In this event, each patient would have to receive a notice from the insurance committee instructing him that Dr. A. was leaving, and that if he desired to change to another doctor he would have one month in which to do so; whereas, if all patients are accepted in the principal's name, no notice of change would have been required at all. Against this is the personal service difficulty. If all patients are on the list of the principal he is held responsible for personal service, and if it is found on an inspection of the prescriptions issued by the practice that only (say) 10 per cent. of these prescriptions are signed by the principal, and 90 per cent. by the assistant, the insurance committee might maintain that the principal is not giving his patients the personal service to which they are entitled. The case being brought before the medical service subcommittee, this argument may be used for refusing permission to employ an assistant when the application next arises.

WHAT IS FARMING-OUT?

It is suggested this is farming-out of practice. No one would defend the real farmer-out of practices to young medical men, in which the younger man does all the work and the principal takes the bulk of the income; especially when as too often happens the junior, misled by promises, finds himself embarrassed later by heavy annual payments for the purchase of a practice of his own making. In such bargains the payment for rent and goodwill are apt far to exceed the normal. Farming-out, moreover, is not likely to occur with one assistant and cases in which more than one assistant is employed are rare. Judging from decisions of the Ministry, the practice of allowing the assistant to do the bulk of the contract work *of a practice is not now* held to constitute farming-out. The assistant gains experience under the supervision of an experienced man, who is responsible for all his errors and has to make certain of continuity in treatment. Many newly qualified assistants, it is true, *are more* efficient in the diagnosis and treatment of disease than the principals who employ them, but they have not had experience of the general problems of practice.

INTERPRETATION OF "PERSONAL SERVICE."

These considerations are relevant to a case recently before the London Insurance Committee in which an elderly practitioner, carrying on the practice of a deceased friend until that friend's son and daughter should have qualified, acted as principal in the practice, *almost gratuitously*, but with the help of a very able assistant paid by fixed salary. The elderly practitioner has been refused permission to continue to employ an assistant on the ground that examination of the prescriptions issued shows him *to be attending to* only a very small amount of the panel work. Meanwhile the assistant is doing the bulk of this work admittedly to the satisfaction of the patients who always ask for him. And there have been no complaints. The case has been referred by the insurance committee to the panel committee for consultation, and should they disagree the Minister will presumably be asked to decide.

Pitfalls of Practice.

A SAMPLE OF COMPLAINTS.

A recent report of the medical service subcommittee for London gives an account of some more[1] of the pitfalls into which insurance practitioners are apt to fall, sometimes through inadvertence, sometimes through want of care, and the kind of action taken by the insurance committee, through its statutory subcommittee, in dealing with complaints.

CERTIFICATION.

An approved society complained of wrongful *certification under the following* circumstances. A young man was taken ill with rheumatic fever, seen and examined by his doctor and told to go to bed for three months. Regulations require in such a case that an official certificate should be given each week on any day between one Sunday and the next, but to be given on the day the doctor saw the patient or within twenty-four hours. The society and the boy's relations said the doctor did not call to see the boy or to give certificates which were fetched from the surgery. The doctor said he did call. A regional medical *officer* had been called to see the boy in consultation with the panel doctor who, in front of the regional officer, asked the mother and the hich I would refer is this: that Langdon-Down ggested the likeness between the imbecile mongoloids s I call them) and "members of the Mongolian race" ic) "might be due to admixture of Mongolian blood nongst Europeans." For this statement no justifica- on is known to me. Dr. Penrose's whole case against angdon-Down falls to the ground.

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[1] See THE LANCET, 1931, ii., 87.

(2) Dr. Penrose then says that I have "endeavoured follow up this idea, supporting" my "contention y bringing forward many resemblances or 'homo- gies' which (I believe) are common to racial ongolians and this class of imbecile."

I am not quite sure what contention I am thought have endeavoured to follow up, but in my preface— nd elsewhere—I have made it clear (at the expense f repetition for which I have been severely blamed) at all I have consciously tried to do is to demonstrate ow, if my observations on the resemblances (which quite rightly call homologies) are correct, then, *ccepting certain Darwinian premises, we are logically rced to a polyphyletic theory of human origins* which ffords us a coherent and consistent explanation of mongolism." But, in this I am not *following*, I am pposing, Langdon-Down. He found, in his observa- ions, *proof* of the unity of the human race; I find, in he polyphyletic theory, an *explanation* of his observa- ions as confirmed and extended by me.

(3) Dr. Penrose goes on to say that "owing to andsteiner's discovery of the four blood groups" . . . a simple test can be applied to the theories of angdon-Down and Crookshank."

Before agreeing that a simple test can be applied o any theory of my own, I would much like to know n respect of which the test is to be applied. My propositions are set out categorically in Part IV., hapter II., of my book, and I cannot find among them one which is invalidated by anything shown by Dr. Penrose. To which of them is the "simple test" applicable? Moreover, I can find nothing in my remarks on the blood-grouping problems (on pages 276, 277, 278) that is inconsistent with any of Dr. Penrose's observations.

(4) Dr. Penrose gives, as his latest reference to Snyder's work, the paper in the *American Journal of Physical Anthropology* for 1926. This is a good paper, but research, to be up to date, should pay attention to Snyder's *book*, published in 1929, and referred to by me. Moreover, reference should be made to Prof. Haldane's lecture at the Royal Institution, on Feb. 20th, 1931, in which he says that the study of blood transfusion has proved that "all the peoples of the world" are divided into four blood groups, and that it now seems very probable *that humanity began in four different places*. In other words, Prof. Haldane finds that the study of blood-groups leads him to accept my proposition, that, *on the Darwinian premises, we are forced to a polyphyletic theory of human origins*. When I put this notion forward 20 years ago, I was laughed at, openly. To-day, I am happy to accept the work of the hæmatologists, so far as it goes, as confirming this proposition to which I have consistently adhered.

(5) Dr. Penrose says, however, that "an hypothesis was put forward by Crookshank that Mongolian imbeciles were related in some way to orang-utan monkeys." In saying this, Dr. Penrose is "arguing" much as Wilberforce did with Huxley, on a celebrated occasion. (According to Darwin and Huxley, both Dr. Penrose and myself are "related" to all sorts of monkeys, and even to amœbæ!) But Dr. Penrose writes as if I suggested "Mongolian imbeciles" to be a special breed of human or semi-human beings, isolated (like the Chillingham cattle) from their kin, and the offspring of really shocking affairs with "orang-utan monkeys." What I do suggest is that we get a good "explanation" of the phenomena of "mongolism" if we regard the *imbecile* mongoloids as expressing conflict between parental ancestral strains, the *non*-imbecile mongoloids being, not so much the result of conflict, as of harmony, between certain ancestral strains, united, or segregating out, in the parents ("The Mongol in our Midst," pp. 412, 440, et al). And, very happily for myself, this kind of conclusion has received confirmation from the work of Mjoen and others. This work shows us how in Scandinavia, where crossings still occur between "Nordics" and Lapps, sometimes one racial influence may be prepotent, sometimes a homogeneous blend may occur, sometimes some characters of each (race) may be present, and sometimes "each organ may be a kind of mosaic." More simply: when there is a double ancestral strain, sometimes a fairly high type with predominance of one influence, and sometimes degeneration and mental defect may occur. This is exactly what I have postulated in "explanation" of the phenomena of mongolism in Europe: if, that is, we accept the polyphyletic hypothesis.

(6) Now, what we really need to know is: how do the blood characters segregate out, in these circumstances? We want to know what are the blood group characters of the different types of Nordic-Lapponic crossings before we can say that anyone's results are "quite inconsistent with the theories of Langdon-Down and Crookshank." It is precisely because I wished to avoid any a priori conclusions, such as Dr. Penrose has made, that I wrote as carefully as I did concerning the blood grouping problem, on pp. 276–8 of my book.

(7) Finally, may I observe that Dr. Penrose is unfortunate in putting the statement that, in "European countries" A is much more common than B, in antithesis to the dictum that the incidence of B is high in Mongolian races. For Snyder finds a "Hunan" type, "with an exceptionally high frequency of A and a low frequency of B," in Korea, Japan, Southern China, and also *amongst Hungarians, Poles, Ukrainians, and Egyptians, suggesting the possibility of Mongolian relationships in the ancestry of these peoples*. In other words, the results given by Dr. Penrose suggest for the "Mongolian imbeciles" exactly what Snyder finds possible, and anthropologists admit, for many Central and Eastern Europeans!

(8) And there, I think, the hæmatological question must be left at present. I am not concerned to stress the importance of the blood groupings either way: too much still awaits examination. But I do think that those who are inclined to differ from me, on a priori grounds, should do me the compliment of finding out what it is I mean, or, at any rate, of accepting my word for it when I say what I mean.

Dr. Penrose's work does not invalidate or controvert a single statement that I have made, so far as I can see. If I am wrong, I will be happy to acknowledge my error, for, once more, I have tried to prove nothing but this: that, accepting certain observations, then, on the Darwinian hypothesis, we are forced to a polyphyletic theory of human origins, and have a consistent and coherent "explanation" of the occurrence of mongoloids among us.

But I wish some statistician would tell me what, according to Poisson's ratio, is the probability of error when, by means of a hundred or two blood examinations, a *petitio principii*, and some a priori

CORRESPONDENCE

ARTERIAL ATONY AND ARTERIO-SCLEROSIS.

To the Editor of THE LANCET.

SIR,—I cannot claim the authority to express an opinion upon the general argument embodied in Prof. Plesch's article in your current issue, but I cannot allow to pass unchallenged his assertions that athletes show marked calcification by the age of 35 or 40; that they are seldom capable of great physical effort when they attain middle life; and that most of them die before 50. In your annotation, "Another View of Arterio-sclerosis," you express the opinion that there may be many who will disagree with these assertions. I shall be surprised to find any who will agree with them. In a desire to reconcile contradictory opinions you suggest that Prof. Plesch may be referring to those who give their whole time to athletics and not to those who take part in sport merely as a recreation. I do not find it easy to picture precisely what is meant by the category of "whole-timers" unless it is an attempt to separate the amateur from the professional, a distinction which for several reasons is of no value.

Before dealing with Prof. Plesch's own assertions, I must refer to your statement that it is pretty generally agreed that exercise raises the blood pressure, in particular the systolic, considerably. This is perfectly true, but there is no support for your subsequent statement that the systolic pressure remains high for a considerable time after the exercise is finished and slowly returns to normal. On the contrary, the fall in blood pressure on the cessation of exercise is comparatively abrupt; and a return to the resting state (or a little lower) is to be expected in from one to four minutes. Possibly the proverbially low pressure of the athlete is what Prof. Plesch refers to as "the severe relaxation which follows all heavy bodily exertions," though it is strange to hear such a desirable condition invested with pathological significance.

In 1873 Morgan undertook a laborious investigation into the life-histories of all who had rowed in the Inter-University Boat Race between the years 1829–1869. In 1904 Meylan studied similarly the Harvard oarsmen who had rowed between 1852 and 1892. Their results were in close correspondence and showed a life expectation of nearly five years longer than that of the selected risks of insurance tables. They found, moreover, no evidence of impaired efficiency in regard to mental or physical activity and clearly they were dealing with a form of exertion which is universally accepted as the most exacting to which the human frame can be subjected.

The greatest long-distance runner in the world at the present day is well over 50 years of age. The holder of the 40 miles record established 49 years ago is an octogenarian who competed in races until he was 60, and made a practice until only a few years ago of running a mile on his birthday. Sexagenarians and septuagenarians could be enumerated literally in scores who, in their youth, were prominent performers in every branch of sport, and whose present condition for their age it would be impossible to surpass. As you submit in your annotation, arterio-sclerosis is an obscure condition and any thoughtful work on it is therefore welcome. But if the value of Prof. Plesch's paper depends upon the accuracy of his statements which refer to the influence of exercise, I do not think it will be a reliable contribution.

I am, Sir, yours faithfully,
ADOLPHE ABRAHAMS.

Brook-street, W., Feb. 22nd.

BLOOD GROUPING OF MONGOLIAN IMBECILES.

To the Editor of THE LANCET.

SIR,—Dr. L. S. Penrose has contributed to your issue of Feb. 20th some interesting information about blood grouping among Mongolian imbeciles. I cannot, however, forbear pointing out, in the interests of scientific truth, what I believe to be a fallacy in his argument.

Dr. Penrose appears to me to have assumed that some linkage exists between the Mendelian characters giving rise to the blood group reactions and those characters, whatever they may be, which are responsible for Mongolian appearance. No one, as far as I am aware, has ever supposed that such a linkage exists, the variation in the incidence of the A and B factors in different races being presumed to depend upon the racial ingredients from which the race, as we now know it, was originally derived. If the sporadic appearance of Mongol characters in imbeciles among white races is really due to the admixture of Mongol stock, this admixture of factors, usually latent, must have taken place in the distant past, and the racial characters must be as thoroughly "mixed in" as the blood group factors. Unless there is a linkage between Mongol characters and the B factor, there could now be no relation between them, and the "Mongol theory" would be neither supported nor refuted by the incidence of blood groups. As far as is known parents both belonging to Group O are as likely as any others to produce a Mongolian imbecile, although this imbecile could not conceivably contain the B factor.

Dr. Penrose's observations are of some intrinsic interest, but they appear to me to be in fact totally irrelevant to the theories of the origins of these imbeciles which he is considering.

I am, Sir, yours faithfully,
GEOFFREY KEYNES

Park-square West, N.W., Feb. 22nd, 1932.

To the Editor of THE LANCET.

SIR,—Dr. Penrose, in your last issue, makes som references to myself and my book ("The Mongol i our Midst," 1931) in terms which are perhaps necessar for sustention of the thesis that I am in the wrong but which do not seem to me, at first blush, to b related very closely to what I have said. May therefore try to express clearly what are my view as set out in the book in question?

But, may I first enter a protest against the continue use of the ugly expression "Mongolian imbeciles" This, if it means anything at all, means Mongolia persons who are imbecile. The use of it, in ou literature, for persons who are never Mongolian, an not always imbecile, gives offence: (1) to Japanes and Chinese ladies and gentlemen; and (2) to som English parents of the children who are neith Mongolian nor imbecile.

Surely it is much better to speak of the children an adults we have in mind, as *mongoloids*, indicatin marked mental defect, if need be, by the prefixatio of the word imbecile? We then have: (1) mongoloids and (2) imbecile mongoloids. (I can think of n objection to this terminology except that I hav suggested it; I have often considered the advisabilit in the general interest, of ascribing its invention someone else.)

(1) The first statement made by Dr. Penrose

ULCUS TROPICUM.

To the Editor of THE LANCET.

Sir,—I read with great interest Dr. Kerley's paper this subject in your issue of Jan. 30th (p. 235) and was impressed with the idea that he is seeking a cific treatment. Reference to a previous communi-ion of mine to THE LANCET (1930, ii., 1220) will ely satisfy him.

I live in a country (Transjordania) where the ulcus picum is quite common. Here it is called jericho jeresh ulcer. No matter how uncertain the iology may be, it is undisputed that the condition found only in hot (tropical and subtropical) countries. us it is reasonable to treat it with excessive cold. experience, as well as the experiences of stinguished dermatologists in Arabia, make me k upon solid carbon dioxide, which has a tempera-re of 79° C. below zero, as the specific of ulcus picum. Moreover, the beneficial effect of the cocytosis that follows application of the solid gas undeniable. By a special condensing apparatus, rbon dioxide gas, under pressure from iron cylinders, condensed within two minutes into solid snow. uterising the ulcer for a minute by the solid rbon dioxide thus obtained reduces it to a simple in ulcer that can be cured within two to three eeks, with a simple antiseptic dressing (e.g., ointments jellidol, rivanol, or protargol). And if the ulcer is seen early, it heals without leaving a scar. I do not need to cite cases to prove the specificity of the solid gas. What I related in my last communication is quite enough, and I have seen and cured tens of cases since. I like to ascertain that every case is examined microscopically, and is found positive for leishmania parasites.

I do not agree with Dr. Kerley that the condition is "very much more common in men than in women and children." In my experience it is more often seen in women. I have three patients under treatment now and they are all young girls. The reason for the difference is, I think, that women's dress leaves more parts exposed than men's. The general condition, also, is not much to be blamed, for all my patients are healthy and robust.

As to transmission, the mosquitoes are the primary factors in Arabia. Nevertheless, indirect infection by flies canot be ruled out.

I am, Sir, yours faithfully,

Feb. 11th, 1932. D. F. TUTUNJI.

SURGICAL SPIRIT.—In reply to Dr. R. Prosser White, Dr. L. P. Garrod writes to point out that the surgical spirit to which he was alluding is not "alcohol diluted 1 in 5 of water," but industrial alcohol (as generally used for surgical purposes) which contains 5 per cent. methyl alcohol, approximately 95 per cent. ethyl alcohol, and only a trace of water.

PUBLIC HEALTH SERVICES

MENTAL HOSPITAL REPORTS.

THE EAST SUSSEX COUNTY MENTAL HOSPITAL at HELLINGLY had 1279 patients in residence on an. 1st, 1931. The recovery-rate for the year was 37·6 per cent. and the death-rate 6·33 per cent. Of those discharged recovered 55 were previously ent out on trial, 25 of them with a money allowance. The general health of the patients was good apart from an attack of influenza, a small outbreak of measles, and a slight epidemic of diarrhœa. The commonest causes of death were pneumonia and hronic nephritis; there were only six deaths from uberculosis. The malarial treatment of general paralysis has been continued; two female patients ailed to develop malaria and of the remaining 16 cases two were discharged recovered and two were improved. One female patient benefited considerably from intrathecal injections of neosalvarsanised serum. Of a number of cases of dementia præcox treated with intramuscular sulphosin, 25 per cent. were discharged recovered. These two forms of therapy naturally throw considerable work on the laboratory, which has also found time to investigate acidosis, liver function, and renal functions in mental disease and to do a considerable amount of work for local authorities. Special efforts were made during the year to develop occupational therapy, and marked mental improvement has been *noted*. The visiting surgeon performed four major operations during the year, the ophthalmic surgeon saw 283 patients, and the dental surgeon visited weekly. Nine men had full parole, and 63 men and 132 women had parole within the estate. Three wards and four villas are open to the grounds. When the weather is favourable many of the patients have their meals out of doors. The visiting commissioners express regret that in so well-equipped a hospital there should be no X ray outfit. The shortage of nurses is slightly less acute. During the year seven attendants and 16 nurses obtained their R.M.P.A. certificate, bringing the total certificated and registered to 59 men and 61 women.

The WEST RIDING MENTAL HOSPITAL at STORTHES HALL housed 1856 patients at the end of 1930. The recovery-rate for the year was 22·92 per cent. and the death-rate 8·23 per cent. A number of patients were sent out on trial before discharge, 35 of them with money allowances. The general health was satisfactory; there were two cases of dysentery and a carrier was found. Only six patients were suffering from tuberculosis and there was no other epidemic disease. Twenty-two cases of general paralysis were treated with malaria and four recovered sufficiently for discharge; of the 50 patients treated during the last three years 7 have been discharged, 21 have improved, and 9 have died. Nine cases of dementia præcox were given intramuscular sulphosin but without any lasting improvement. The dental surgeon visited weekly and saw a large number of patients. An out-patient clinic is open on two afternoons a week at the hospital, but its success is unfortunately limited by its inaccessibility and a certain amount of prejudice. Ten men have full parole and 71 men and 13 women have parole within the grounds; four wards are "open door." The laboratory carried out a large number of routine investigations and all new cases admitted were tested for dysentery and typhoid. Of the nursing staff 48 men and 26 women are certificated or registered, four men and six women having obtained *their* R.M.P.A. certificate during last year.

The SOUTH YORKSHIRE MENTAL HOSPITAL at WADSLEY, near Sheffield, had 1954 patients resident on Dec. 31st, 1930. The recovery-rate for the year was 34·7 per cent. and the death-rate 9 per cent. Autopsies were held on 97·7 per cent. of the fatal cases. A severe form of diarrhœa, for which no cause could be found, attacked some female patients early in the year, but did not cause any deaths. There was one case of enteric fever, two of scarlet fever, two of dysentery, four of erysipelas, 10 of influenza, and 11 of tuberculosis. Leave of absence was granted to 132 men on 563 occasions and to 106 women on 307 occasions, full parole to 30 patients, reasoning, a "simple test" is applied to considerations *concerning descent through hundreds of thousands* of years and thousands of millions of Mongolians and "orang-utan monkeys." Cannot we look at things *sub specie æternitatis?* If we did, we should save ourselves much trouble, and all be as good friends as I am sure Dr. Penrose and I want to be.

I am, Sir, yours faithfully,

Wimpole-st, W., Feb. 19th, 1932. F. G. CROOKSHANK.

METEOROLOGICAL FACTORS AND HEALTH.

To the Editor of THE LANCET.

SIR,—In his interesting letter in your issue of Feb. 13th (p. 370) Fleet-Surg. W. E. Home claims that there is much more to learn about the influence of weather on health. Concerning the influence of various climates and different localities on sundry diseases we possess a wealth of literature, and much weighty opinion, but no facts worth serious consideration. It should be possible, with a little trouble, to ascertain how a sufficiently large number of cases fare in certain climates as compared with controls elsewhere, but I have seen no serious attempts to make these observations, and the individual instances which may be the source of the obiter dicta of great men are of little value. With State medicine expanded as it is to-day, it should be possible to carry out such work, and perhaps most easily in the domain of tuberculosis.—I am, Sir, yours faithfully,

Paignton, Feb. 18th, 1932. ERNEST WARD.

THE SPAHLINGER REMEDIES.

To the Editor of THE LANCET.

SIR,—The concluding sentence of your editorial in THE LANCET of Feb. 6th, dealing with the Spahlinger remedies, runs as follows: "Mr. Spahlinger may safely join the freemasonry of bacteriologists who share their knowledge for the benefit of medicine and mankind." I read this to mean that you invite Mr. Spahlinger to accept the canons which govern other bacteriologists, and by so doing enjoy the status and the security which such acceptance confers. I find, however, that your words have been construed by some to mean that, in your judgment, Mr. Spahlinger, by such revelation as he has made of the methods by which his tubercle vaccines are made, has already earned for himself this place alongside pioneers in the field of immuno-therapy.

I feel sure that such a construction of the words quoted above was not intended, nor does the general tenor of your remarks suggest it. It will not have escaped your attention that concerning his tubercle *serum*, and the formulæ relating to it, Mr. Spahlinger has said nothing at all. Yet it is this preparation upon which, in the main, he has for the past twenty years based his claim to *cure* tuberculosis. And it is upon this substance that his reputation with a certain section of the public, and with a few of the less critical members of the profession, rests.

Having watched, for several years, Mr. Spahlinger's fruitless efforts to get his remedies accepted and used by British doctors, whilst still insisting that these remedies shall remain of the nature of secret and proprietary *medicines, this present development* interests me greatly. Your readers at least, however, will not draw inferences from it that are not warranted by the facts. Many honest and generous offers have been made to help Mr. Spahlinger to finance his remedies. Five years ago, when his friends complained that his beneficent work was being starved for lack of funds, the *Daily Express* offered Mr. Spahlinger the handsome sum of £10,000 to further his researches on condition that he would give facilities to a small medical committee to examine his methods and to report upon them. The offer was not accepted.

Since *the acceptance into the freemasonry of* bacteriologists is, to adopt your own standard, limited to those who share their knowledge for the benefit of medicine and mankind, and since Mr. Spahlinger has not so shared his knowledge, his entry into that brotherhood must be deferred until he has fully complied with this requirement.

I am, Sir, yours faithfully,

THOMAS HORDER.

Harley-street, W., Feb. 15th, 1932.

*** Sir Thomas Horder's reading of our words is correct.—ED. L.

SIZE OF WOMEN'S FEET.

To the Editor of THE LANCET.

SIR,—In a demonstration of genuine period clothes dating from 1780 recently arranged in Bristol, it was found that none of the ladies taking part could put on the shoes corresponding to the earlier costumes, as they were much too small. Is the fact that women's feet were so much smaller 100 years ago well-recognised? If it is so, I suppose exercise and a healthier life have been responsible for the change.

I am, Sir, yours faithfully,

J. T. IRVING, M.D., Ph.D.

University of Bristol, Department of Physiology,
Feb. 20th, 1932.

THE EARLY TREATMENT OF RHEUMATIC DISEASE.

To the Editor of THE LANCET.

SIR,—Attention is being very properly called to the world-wide suffering caused by rheumatic disease and to the necessity, from a medical point of view, of getting to closer grips with the problems of cause and cure. In this connexion I am writing on behalf of the Committee of the Royal Mineral Water Hospital at Bath, a national institution nearly 200 years old, to point out to the medical profession the necessity of sending patients for treatment in the *early* stages of the disease. If that is done there is hope of a cure, but what so frequently happens is that the patien is sent to us as a last resort, partially or entirely incapacitated, when cure is out of the question, and a certain amount of alleviation is often all that can be done. If however doctors would bear in mind the great good that can be effected in the early stages of the disease and would advise their patients to apply for admission to this hospital as a *first and not* as a *last* resort, very great good would, without question, result (1) to the patients themselves, (2) to the knowledge and treatment of the disease from a medical point of view. I venture to ask you to insert this appeal in the hope that this most important matter may receive the attention it deserves.

I am, Sir, yours faithfully,

GODFREY LIPSCOMB,
President, Royal Mineral Water Hospital, Bath.

Feb. 18th, 1932.

PARLIAMENTARY INTELLIGENCE

NOTES ON CURRENT TOPICS.

DANGEROUS DRUGS BILL.

The Earl of LUCAN (Captain of the Gentlemen-Arms), in moving the second reading of the ngerous Drugs Bill in the House of Lords on ednesday, Feb. 17th, said that its objects was to end the Dangerous Drugs Acts 1920–25 so far as s necessary to enable the Government to ratify e International Convention signed at Geneva in e summer of last year to limit the manufacture d to regulate the distribution of narcotic drugs. n extensive illicit traffic in such drugs as *morphine*, roin, and cocaine was being carried on in many rts of the world, and that traffic was facilitated by e fact that these drugs were being produced in antities largely in excess of the medical and scientific quirements of the world. The Opium Advisory ommittee of the League of Nations had advocated e limitation of the manufacture of these drugs and nsidered that the most effective step towards ppressing the illicit traffic would be to prohibit e production of quantities beyond those which were quired for medical and scientific purposes. Such mitation could only be brought about by inter-ational agreement.

The Bill was read a second time.

Clause 1 of the Bill is as follows :—

(1) The following shall be substituted for Subsection (1) f Section 8 of the Dangerous Drugs Act, 1920 (in this Act eferred to as "the principal Act"):—"(1) The drugs o which this part of this Act applies are—(*a*) medicinal pium; (*b*) any extract or tincture of Indian hemp; (*c*) morphine and its salts, and diacetylmorphine (commonly known as diamorphine or heroin) and the other esters of morphine and their respective salts; (*d*) cocaine (including synthetic cocaine) and ecgonine and their respective salts, and the esters of ecgonine and their respective salts; (*e*) any solution or dilution of morphine or cocaine or their salts in an inert substance whether liquid or solid, containing any proportion of morphine or cocaine, and any preparation, admixture, extract, or other substance (not being such a solution or dilution as *aforesaid*) containing not less than one-fifth *per cent.* of morphine or one-tenth per cent. of cocaine or of ecgonine; (*f*) any preparation, admixture, extract, or other substance containing any proportion of diacetylmorphine; (*g*) dihydrooxycodeinone, dihydrocodeinone, dihydromorphinone, acetyldihydrocodeinone, dihydromorphine, their esters and the salts of any of these substances and of their esters, *morphine-N-oxide (commonly* known as genomorphine), the morphine-N-oxide derivatives, and any other pentavalent nitrogen morphine derivatives; (*h*) thebaine and its salts, and (with the exception of methylmorphine, commonly known as codeine, and ethylmorphine, commonly known as dionin, and their respective salts) benzylmorphine and the other ethers of morphine and their respective salts; (*i*) any preparation, admixture, extract, or *other* substance containing any proportion of any of the substances mentioned in paragraph (*g*) or in paragraph (*h*) of this Subsection.

For the purpose of the foregoing provision the expression "ecgonine" means lævo-ecgonine, and includes any derivatives of ecgonine from which it may be recovered industrially, and the *percentage* in the case of morphine shall be calculated as in respect of anhydrous morphine.

(2) Subsection (2) of Section 8 of the principal Act (which empowers His Majesty to declare that Part III. of that Act shall apply to certain new derivatives) shall be amended by the insertion after the words "if improperly used" of the words "or is capable of being converted into a substance which is, or is likely to be productive, if improperly used."

Clause 2 declares that: (1) It shall not be lawful for any person in the United Kingdom to trade in or manufacture for the purpose of trade any products obtained from any of the phenanthrene alkaloids of opium or from the ecgonine alkaloids of the coca leaf, not being a product which was on the *thirteenth* day of July, nineteen hundred and thirty-one, being used for medical or scientific purposes: Provided that if His Majesty is at any time satisfied as respects any such product that it is of medical or scientific value, he may by Order in Council direct *that this* Subsection shall cease to apply to that product.

(2) If it is made to appear to His Majesty that a decision with respect to any such product as is mentioned in Subsection (1) of this Section has in pursuance of Article 11 of the Geneva Convention (No. 2) been communicated by the Secretary-General of the League of Nations to the parties to the said Convention, His Majesty, by Order in Council, may, as the case requires, either declare that the provisions of the said Part III. shall apply to that product in the same manner as they apply to the drugs mentioned in Subsection (1) of Section 8 of the principal Act as amended by this Act or apply the said Part III. to that product with such modifications as may be specified in the Order.

(3) His Majesty may by Order in Council apply Part III. of the principal Act, with such modifications as may be specified in the Order to any of the following drugs, that is to say, methylmorphine (commonly known as codeine) ethylmorphine (commonly known as dionin) and their respective salts.

It is provided in Clause 3 that Subsection (2) of Section 6 of the Dangerous Drugs and Poisons (Amendment) Act, 1923 (which defines the expression "corresponding law"), shall have effect as though the reference therein to the provisions of the Hague Convention included a reference to the provisions of the Geneva Convention (No. 1) and the Geneva Convention (No. 2).

Under Clause 4 an Order or Declaration made by His Majesty in Council under the Dangerous Drugs Act, 1920 to 1932, may be varied or revoked by a subsequent Order or Declaration made in the like manner and subject to the like provisions.

Clause 5 provides that the Act shall not extend to Northern Ireland except in so far as it amends the Dangerous Drugs Acts, 1920 to 1925, in relation to matters with respect to which the Parliament of Northern Ireland have not power to make laws. The Act is to come into operation on such date as His Majesty may by Order in Council appoint, and different dates may be appointed for different provisions of the Act and in relation to different countries. Lastly, Section 3 and Section 6 of the Dangerous Drugs Act, 1925, are repealed.

UNEMPLOYMENT.

"FAILURE TO INITIATE SUCCESSFUL MEASURES."

In the House of Commons on Wednesday, Feb. 17th, Mr. LAWSON moved on behalf of the Opposition :—

> "That this House, recognising the increasing gravity of unemployment and of the condition of the unemployed and their families, regrets the failure of the Government to initiate effective measures for the reconstruction of the economic life of the country and the short-sighted economy of expenditure on works of public utility, especially housing, and on schemes of allotments, whereby unemployment has been increased; and is of opinion that the administration of the means test is causing grave injustice and distress and that the machinery of the poor-law should not be used in connexion with applications for unemployment benefit."

He said that it must have come as a shock to the House and the country to learn that the unemployed had increased by 218,000 upon last month's figures. There were 7000 fewer employed than in October. Even the figure of 218,000 was not altogether accurate, for the Minister of Labour had told the House that during the past three months 130,000 people had lost their employment benefit or any transitional payment which they had previously received. To-day there were 2,750,000 persons unemployed; more than 2,000,000 wholly unemployed, 500,000 temporarily unemployed, and 100,000 casually employed.

"IF THERE WAS A WAR."

With the exception of a comparatively small margin these unemployed persons were men and women of the highest calibre and some of the finest craftsmen in the world to-day. Nothing was being done, and nothing was contemplated to meet the needs of the unemployed. If there was a war to-morrow masses of these people, particularly the youth, would become important people at once. But there was no war and they were scantily clad, half-fed, struggling to maintain their moral, and a menace generally to the vitality of the nation. The Government had taken 10 per cent. of the very meagre sum and restricted parole to 28 men. Four male and three female wards are open to the gardens and two male wards to the grounds generally. The staff of the Institution are assisted by a consulting physician, a consulting surgeon, and a consulting dentist. Out-patient clinics are held at the Sheffield Royal Infirmary and the Sheffield Royal Hospital, and over a thousand cases were seen during the year at each clinic. The treatment of general paralysis by induced malaria was continued, the total number of cases so treated now being 194. Twelve cases were discharged as recovered during the year. The laboratory, in addition to routine work, has carried out a systematic research for carriers of dysenteric organisms. A large number of patients were treated in the X ray and ultra-violet ray department and the dentist examined 542 patients. During the year 14 attendants and 14 nurses obtained their R.M.P.A. certificate, and one nurse obtained the G.N.C. certificate.

At the STIRLING DISTRICT MENTAL HOSPITAL there were 1015 patients on May 15th, 1931, and 24 voluntary patients in addition. The question of overcrowding is receiving the anxious consideration of the new joint committee. The hospital contains a number of mental defectives and senile patients who could with benefit to themselves and to the institution be accommodated elsewhere. The recovery-rate for the year was 40·3 per cent. and the death-rate 10·8 per cent.; post-mortem examinations were carried out whenever permission was given. During the year 14 patients were sent out on trial to their friends. The general health was good, and there was no epidemic disease. The electro-therapeutic department treated 227 patients with good results, and the X ray apparatus was used for diagnosis in 16 cases. The dentist visited weekly and saw 236 patients, many of them with marked oral sepsis. The patients have derived much benefit from their work in the occupational therapy department, and a ready sale has been found for the articles made. The able-bodied male patients work on the farm and garden, and the year was so successful that a balance of £2409 was recorded. The laundry is now entirely worked by electricity and has been cheerfully decorated. During the year eight nurses and nine attendants obtained the R.M.P.A. certificate, which is now held by 40 per cent. of the entire nursing staff.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED FEB. 13TH, 1932.

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 70 (last week 57); scarlet fever, 1422; diphtheria, 991; enteric fever, 31; pneumonia, 1968; puerperal fever, 39; puerperal pyrexia, 97; cerebro-spinal fever, 54; acute poliomyelitis, 4; acute polio-encephalitis, 2; encephalitis lethargica, 14; continued fever, 1; dysentery, 16; ophthalmia neonatorum, 99. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on Feb. 16th–17th was as follows: Small-pox, 118 under treatment, 4 under observation (last week 105 and 4 respectively); scarlet fever, 1175; diphtheria, 1526; enteric fever, 9; measles, 1127; whooping-cough, 340; puerperal fever, 16 (plus 12 babies); encephalitis lethargica, 220; poliomyelitis, 4; "other diseases," 233. At St. Margaret's Hospital there were 19 babies (plus 10 mothers) with ophthalmia neonatorum.

Deaths.—In 117 great towns, including London, there was no death from small-pox or enteric fever, 49 (13) from measles, 6 (2) from scarlet fever, 50 (3) from whooping-cough, 29 (10) from diphtheria, 44 (9) from diarrhœa and enteritis under two years, and 279 (56) from *influenza. The figures in parentheses* are those for London itself.

The reported deaths from influenza are still falling slowly, but the total deaths for the year so far amount to 1990 against 1579 for the corresponding period of 1931. Of the great [illegible] from [illegible] Manchester, and Leicester each with 8. Manchester reported 7 deaths from measles, Portsmouth and Liverpoo each 5. Whooping-cough accounted for 9 deaths at Liverpool, 5 each at Manchester and Birmingham.

The number of stillbirths notified during the weel was 279 (corresponding to a rate of 46 per 1000 births) *including 50 in London.*

THE SERVICES

COMMISSIONS IN THE ROYAL ARMY MEDICAL CORPS.

THE War Office announces that the successf candidates for Commissions in the Royal Arm Medical Corps during January last were as follows D. P. F. Mulvany, Charing Cross; C. S. Gross, Guy' Hospital; J. B. Macfarlane, University of Aberdeen P. J. Richards, St. Bartholomew's Hospital; R. I MacRae, University of Aberdeen; R. St. J. Lybur Trinity College and Dublin; J. V. Quinn, Roy *College of Physicians and Surgeons,* Ireland.

Vacancies still exist, and particulars can be obtaine either by letter, or personally from the Assista Director-General, Army Medical Services, The W Office, London, S.W.1.

ROYAL NAVAL MEDICAL SERVICE.

The following appointments have been notified: Su Lt. Comdrs. A. L. McDonnell to *Canterbury*, and A. de Joyce to *President*, for course. Surg. Lt. J. J. Keevil *Alecto.*

ROYAL NAVAL VOLUNTEER RESERVE.

Proby. Surg. Lts. E. A. H. Hindhaugh and J. F. Heg to be Surg. Lts.

ROYAL ARMY MEDICAL CORPS.

Lt.-Col. H. E. Priestley is placed on the half-pay list account of ill-health.

Maj. (temp. Lt.-Col.) A. E. B. Jones to be Lt.-Col.

Maj. A. Hendry to be temp. Lt.-Col.

The undermentioned Lts. (on prob.) are confirmed their rank: J. T. Robinson, W. A. Robinson, F. K. B A. Macdonald, W. R. M. *Drew*, J. B. George, W. B Brennan, and B. Blewitt.

The undermentioned to be Lts. (on prob.): J. B. Ma lane, and is secd. under the provisions of Art. 213, R Warrant for Pay and Promotion, 1931, W. R. Pa (since decd.), and P. J. Richards.

TERRITORIAL ARMY.

Col. R. E. Bickerton to be Hon. Col. 56th (1st Lond.) Div

Lt.-Col. F. T. Rees to be Bt. Col.

Lt.-Col. & Bt. Col. L. A. Harwood, from R.A.M.C., T.A. to be Col., and to be A.D.M.S., 56th (1st Lond.) Div. T.A. vice Col. R. E. Bickerton.

Maj. T. C. Bowie, R.A.M.C., to be Divl. Adjt., 52nd (Lowland) Div., vice Capt. C. A. Hutchinson, R.A.M.C. who vacates the appt. on completion of tenure.

Maj. G. G. B. Holroyde, R.A.M.C., to be Divl. Adjt. 48th (S. Midland) *Div.*, vice *Maj.* W. Y. Eccott, R.A.M.C. who vacates the appointment on completion of tenure.

Maj. J. L. Hamilton to be Lt.-Col. and to command the 167th (City of London) Fd. Amb.

B. A. Pain to be Lt.

ROYAL AIR FORCE.

Flight Lt. H. C. Sutcliffe Pimblett is granted a permanen commission in this rank.

INDIAN MEDICAL SERVICE.

R. I. Reid and F. C. Jackson to be Lts. (on prob.).

The undermentioned appts. have been made in India:— D.D.M.S.: Maj.-Gen. J. F. Martin. A.D's.M.S.: Col B. H. V. Dunbar, W. W. Browne, J. C. Kennedy, an Lt.-Col. N. E. Dunkerton. R.A.M.C. D.A.D's.M.S.: Maj E. E. Holden, R.A.M.C., and W. Bruce, R.A.M.C. A.D.H. Maj. T. B. Nicholls, R.A.M.C. *A.D's.H. & P.*: Lt.-Col. A. M Fraser, R.A.M.C., and Maj. F. R. Coppinger, R.A.M.C D.A.D's.P.: Majs. F. R. Coppinger, R.A.M.C., and D. T. M Large, R.A.M.C.

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THURSDAY, FEB. 18TH.

Dermatitis and Compensation to Workmen.

Sir VIVIAN HENDERSON asked the Home Secretary ether there had been an increase or a decrease in the umber of cases of dermatitis in the last three years for ich compensation had been paid; and whether any eps were taken by his department to encourage the wearing gloves or mittens in appropriate cases.—Sir HERBERT MUEL replied: The Workmen's Compensation Statistics t 1928, 1929, and 1930 (which is the last year for which gures are available) show an increase in the number of ses. There were 1170 cases in 1928, 1405 in 1929, and 99 in 1930. Various steps have been taken by the Department to enforce or encourage the wearing of gloves as a ecaution against dermatitis. For example, gloves are quired for persons employed in various processes under the hemical Works Regulations of 1922, and the Chromium lating Regulations of 1931, and under the Welfare Order 1918 for use of bichromate potassium or sodium in dyeing, e Hollow-ware and Galvanising Welfare Order of 1921, nd the Tanning Welfare Order of 1930. Further, a general aflet providing information as to the causes of dermatitis nd recommending precautions, including the use of gloves, as been prepared and widely distributed among occupiers f works likely to be affected, and, with a view to securing he coöperation of the workers, a form of cautionary notice hich can be exhibited in the workrooms has been issued nd put on sale through the Stationery Office. Reference also made to the value of gloves in certain special emoranda dealing with the prevention of dermatitis in articular processes. Finally, I may draw attention to the ollection of different kinds of gloves suitable for the purpose hich is on exhibition in the special dermatitis section at he Home Office Industrial Museum in Horseferry-road, Westminster.

Medical Research Committee and Spahlinger Formula.

Mr. HAMMERSLEY asked the Minister of Health when he xpected to receive the observations of the Medical Research ouncil and other competent research bodies on the statement by Mr. Spahlinger containing a formula for the treatment of tuberculosis.—Sir E. HILTON YOUNG replied: I am unable at present to say when it is likely that these observations will be received.

Sterilisation of Mentally Deficients.

Dr. MORRIS-JONES asked the Minister of Health whether he had now considered the setting up of a committee of experts to investigate and report on the question of the sterilisation of the mentally deficient; and when he would be in a position to announce the names of the members of the committee.—Sir E. HILTON YOUNG replied: I have not yet determined the precise form of inquiry which is likely to yield the best results.

Improvement of Unhealthy Areas.

Mr. JOHN asked the Minister of Health if he would state from the passing of the Housing Act, 1930, the number of schemes for the improvement of unhealthy areas submitted to the Ministry and the number confirmed; how many schemes had been undertaken by local authorities and the number completed; the total amount paid on account by the State towards slum clearance; and the ultimate State liability in respect of schemes approved, in continuation of the information given on Feb. 12th, 1931.—Sir E. HILTON YOUNG replied: Up to Jan. 31st last I had received resolutions declaring 377 areas in England and Wales to be clearance areas, and 10 areas to be improvements areas under the Housing Acts, 1930. These resolutions do not require confirmation by me. Complete returns have not yet been received, but at least 308 houses had been demolished in the areas in question by Dec. 31st last. The amount paid on account by the State towards slum clearance during the year 1931 was £83,672, and the ultimate annual State liability is roughly estimated at £280,000.

Results of 1931 Census.

Mr. BROCKLEBANK asked the Minister of Health when he would be able to publish the results of the Census, 1931.—Sir E. HILTON YOUNG replied: It is anticipated that the series of Census Reports will begin to be published about the middle of this year; but it cannot at present be stated when the publication of all reports will be completed.

Appointments of Medical Referees and Assessors.

Mr. THOMAS WILLIAMS asked the Home Secretary if he would take steps to prevent any medical referee or medical assessor being appointed under the Workmen's Compensation Act where such medical referee or medical assessor was acting from time to time in his professional capacity on behalf of the employers, indemnity companies, or workmen's trade union.—Sir HERBERT SAMUEL replied: It is a condition of the appointment of a medical referee that he shall hold no regular employment either on the employers' or on the workers' side, and the medical referees are enjoined that in their private practice they should, as far as possible, avoid cases which may come before them in their official capacity. It has not been considered necessary or practicable to impose more stringent restrictions, but if the hon. Member has some individual case in mind, and will send me particulars, I shall be glad to make any necessary inquiry.

Carbon Monoxide Gas in Coal-mines.

Mr. TINKER asked the Home Secretary if he was aware that, owing to the increased use of explosives and other causes in coal-mines, carbonic oxide gas was generated which caused incapacity and, in some cases, death; and if he would consider placing this among the scheduled diseases under the Workmen's Compensation Act.—Sir HERBERT SAMUEL replied: This question is not a new one and has been examined more than once. In particular, a proposal to schedule poisoning by this gas was considered and rejected by the Industrial Diseases Committee of 1907, on evidence that the effects of such poisoning are invariably sudden and therefore in the nature of accidents, and already covered as such by the Act. The question whether all cases are so covered has however been recently referred for further examination to the Industrial Diseases Committee, now sitting under the chairmanship of Sir Humphry Rolleston, and if the hon. Member is aware of any cases showing the need for an extension of the schedule, I would suggest that he should send full particulrs to the Secretary of the Committee at the Home Office.

London Refuse.

Mr. MCENTEE asked the Minister of Health if it was proposed to take any action on the Report of the Departmental Committee on London Cleansing, issued in May, 1930; and whether any regulations were to be issued prohibiting the dumping of crude refuse in dumps adjacent to villages or occupied houses in the Home counties.—Sir E. HILTON YOUNG replied: The Metropolitan Authorities have been pressed to discontinue the insanitary tipping of refuse, and active measures have been taken by some of them. The main recommendations of the Departmental Committee would require legislation, of which I see no prospect this session. But the Town and Country Planning Bill now before Parliament contains proposals for empowering local authorities to control the deposit of refuse by provisions in planning schemes.

Salaries of Local Government Officers.

Mr. HICKS asked the Minister of Health whether the temporary voluntary abatements of wages and salaries which local government officers and servants had been subjected to as a result of the national economy measures were to be taken into account for the basis of pension; and, if so, whether he would consider making amendments to the Superannuation Acts that affected local government officers and servants, so that their pension rights should not be reduced as a consequence of these temporary abatements.—Sir E. HILTON YOUNG replied: I have asked the several associations of local authorities for their views as to the desirability of legislation for this purpose. The further consideration of the matter must await the receipt of their replies.

Grading of Milk.

Lord SCONE asked the Minister of Health whether he would consider the advisability of reclassifying the various grades of milk produced in this country, and also the present position, in which the consumer was led to believe that Grade A milk was the highest class produced, whereas it was in reality only of third-class quality.—Sir E. HILTON YOUNG replied: I will consider the matter in consultation with my right hon. friend the Minister of Agriculture and Fisheries. But any reclassification of graded milks on the lines suggested by my noble friend would require legislation, provided for the unemployed. The Chancellor of the Exchequer spoke the other night about the cost of living being artificially low. If the right hon. gentleman could try for a week the standard of living of some of these people he would know that the cost of living in proportion to the money which they received was very high. He asked the Government whether it was not time that they considered the restoration of the money which had been cut off unemployment benefit. The Government had better be careful what they did in the way of relieving the taxation of the comfortably placed classes in view of the state of mind of the people of this country at the present time. The Minister of Labour stated in January that on Dec. 21st there were 742.222 men and 97,000 women with applications for transitional benefit. The claims of 683,442 men and 78,000 women were authorised for payment, while the needs of 59,000 men and nearly 19,000 women were not held by the local authorities to justify payment. That was roughly the starting of the operation of the means test. When everything was said and done the fact remained that the Government had put nearly 1,000,000 unemployed persons into the same position as the paupers of this country. He urged the Government to take this motion seriously. The living of many people depended upon it. There were children lacking shoes to-day as a result of the present policy.

Mr. TINKER seconded the motion.

GOVERNMENT REPLY TO CRITICISM.

Sir HENRY BETTERTON (Minister of Labour) said that during the first seven or eight months of last year—in fact until the Labour Government left office—the unemployment figures increased month by month until they reached their peak at that time. Had it not been for the very heavily increased taxation which the present Government were compelled to lay on the shoulders of the people of this country last October there was very little question but that the situation would be much better than it was to-day. When the Labour Government was in office two years the results of their efforts to reconstruct the economic life of the country was that the country was brought to the verge of bankruptcy. During that period unemployment increased by 136 per cent., or by 1,500,000. If that was their idea of reconstructing the economic life of the country, it was indeed a lesson and a warning. The present Government was asked to continue the vicious circle of increased national expenditure and increased rates. If that were done it would increase unemployment. Much of the criticism which had been levelled against the needs test in the House and in the country was due to a very imperfect appreciation of the fact that transitional payments were not insurance benefit, but State maintenance paid to those who had exhausted their insurance rights. Was the Labour Party in favour of State relief being given, without any insurance qualification and without any consideration as to the means of the applicants?

THE POOR-LAW STIGMA.

In the administration of this matter by the Public Assistance Committees the Government had taken every step in their power to ensure that what was called the stigma of the poor-law should not affect the applicants at all. Some lack of uniformity was inevitable where there were different bodies administering these cases in different areas. On the other hand, it was only right that there should be some lack of uniformity, because it might be that in some districts rents and the cost of living were higher. He had done his best, however, to see that the means test was not worked harshly or unfairly. As a result of representations which had been made to him, and as a result of the advice and efforts of the inspectors of the Ministry of Health, the discrepancies had now been largely removed. There were still some discrepancies arising from a difference in poor-law conditions and practice, but he understood that the Minister of Health was going to summon a conference of public assistance committees from the difficult areas and to ask them to consider jointly how variations in practice, for which no justification could be proved, could be removed. As to the question of disability pensions, he had satisfied himself that in the interests of the disabled men themselves justice could best be done by individual and sympathetic treatment of cases on their merits. The Public Assistance Committees had the necessary discretion to take into account the extra needs of a disabled man.

SIGNS OF RETURNING CONFIDENCE.

He believed that there were signs at this moment of returning confidence in the country. If they regarded the position as it was last August, and the prospects to-day, it was clear that the country was gradually, painfully, and very slowly surmounting some of these difficulties which last summer seemed absolutely overwhelming. With a balanced budget and with determination on the part of all sections of the community to face realities, the failure to do which in the past had been so largely the cause of our troubles, the country could look forward to the future with a good deal more confidence than seemed possible last year. (Cheers.)

SPECIAL COMMISSION TO BE CALLED.

After further debate,

Sir E. HILTON YOUNG (Minister of Health) said that in addition to the conference of Public Assistance Committees (which had been referred to by the Minister of Labour) he proposed, in order that there might be an even wider coöperation between different areas, to call a conference of what he might call a special commission or departmental committee of the most experienced inspectors of the Ministry of Health, who should attend the area conferences and spread the light of information and coördination from one part of the country to the other. In that way they would be able to get rid, by the natural process of administration, of those variations in practice which were unnecessary. The Government would watch for any opportunity of promoting works which would provide employment subject to two conditions: first, that the works would be definitely remunerative; and secondly, that they could not just as well be undertaken by private enterprise without Government assistance. They desired to turn away once and for all from the policy, which was followed like a will-'o-the-wisp by the Labour Government, to a policy of economy which they believed was essential to the welfare of the country.

The motion was rejected by 415 votes to 39.

DANGEROUS DRUGS BILL.

The Dangerous Drugs Bill passed through Committee in the House of Lords on Tuesday, Feb. 23rd, with one small drafting amendment.

HOUSE OF COMMONS.

WEDNESDAY, FEB. 17TH.

Hospitals and Motor Accident Cases.

Dr. HILLMAN asked the Minister of Transport if he was aware that, from a recent inquiry by the Yorkshire Voluntary Hospitals Committee relative to the number of third-party motor accidents treated in 36 hospitals in Yorkshire during the first six months working of the Road Traffic Act, 1030 it appeared that the total cost incurred by the hospita for treating these cases amounted to £4500, of which sum only £123 was recovered from accident insurance companies; and whether he would amend the Road Traffic Act accordingly.—Mr. PYBUS replied: While I sympathise with the difficulties of the hospitals, I am afraid I cannot see my way to introduce further legislation.

Duty on Imported Petrol.

Sir VIVIAN HENDERSON asked the Chancellor of the Exchequer whether it was the intention of the Government that the existing duty on imported petrol and similar oils should still apply to such imports from the Empire after ch 1st.—Major ELLIOT (Financial Secretary to the asury) replied: As hydrocarbon oils are goods chargeable a an existing duty of customs, they will not be affected the proposals in the Import Duties Bill, which are what esume my hon. friend has in mind.

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Grading of Milk.

Lord SCONE asked the Minister of Health whether he would consider the advisability of reclassifying the various grades of milk produced in this country, and also the present position, in which the consumer was led to believe that Grade A milk was the highest class produced, whereas it was in reality only of third-class quality.—Sir E. HILTON YOUNG replied: I will consider the matter in consultation with my right hon. friend the Minister of Agriculture and Fisheries. But any reclassification of graded milks on the lines suggested by my noble friend would require legislation.

and I regret that at present I cannot contemplate the introduction of legislation on this subject.

Milk Prosecutions.

Mr. GLOSSOP asked the Minister of Health the number of prosecutions that have taken place in England during 1929, 1930, and 1931, in connexion with milk deficient in fat, together with the number of convictions obtained.

Brigadier-General CLIFTON BROWN asked the Minister of Health how many prosecutions for too low a percentage of butter fat under the Milk Adulteration Order came before the courts in 1931; and in how many of these cases were convictions obtained.—Sir E. HILTON YOUNG replied: I regret that I am unable to give all the information asked for, but in 1931 there were 98 prosecutions for the sale of adulterated milk in London, and convictions were obtained in 51 cases, two being still outstanding. The total number of samples of milk reported as adulterated in England and Wales is roughly 15 times the number so reported in London.

Brigadier-General CLIFTON BROWN asked the Minister of Health how many samples of fresh liquid milk were taken during the last three months by the port sanitary authorities of London, Harwich, and Newhaven, respectively; and whether any of these liquid milk imports were rejected for not being up to standard requirements in cleanliness and butter fat.—Sir E. HILTON YOUNG replied: The answer to the first part of the question is 8, 49, and 13 respectively. Three samples taken at Harwich and seven taken at Newhaven failed to comply with the bacterial standard laid down, and the importation of milk from the sources of supply of these samples has been discontinued. Ninety-three samples taken at the ports in question were examined by the Government chemist, and none was reported as deficient in butter fat.

Death Sentence on Young Persons.

Mr. GOLDIE asked the Home Secretary of State for the Home Department the number of occasions on which since the year 1922 sentence of death had been pronounced upon persons between the ages of 16 and 21; and in how many cases capital punishment had been executed in the said period upon such persons.—Sir HERBERT SAMUEL replied: During the ten years from 1922 to 1931 inclusive the figures were 18 and 4. I would add that the executions took place in the years 1922, 1923, 1925, and 1926, and that the ages were between 18¼ years and 20½ years.

Slum Clearance in Lancashire.

Mr. HAMILTON KERR asked the Minister of Health how many slum clearance schemes had been approved in Lancashire, and in which towns, since the passing of the Housing Act of 1930.—Sir E. HILTON YOUNG replied: Seventy-two clearance areas have been declared in Lancashire. The following is a list of the towns concerned. *County Borough Councils:* Bolton, Bootle, Liverpool, Manchester, Preston, Rochdale, Salford, and Wigan. *Non-County Borough Councils:* Ashton-under-Lyne, Eccles, Leigh, and Rawtenstall. *Urban District Councils:* Atherton, Dalton-in-Furness, Farnworth, Leyland, Newton-in-Makerfield, Orrell, Prestwich, Swinton and Pendlebury, and Whitefield.

Rural Housing.

Mr. PARKINSON asked the Minister of Health how many houses had been approved under the Housing (Rural Authorities) Act, 1931.—Sir E. HILTON YOUNG replied: The Committee appointed under the Act have informed 110 authorities that they are prepared to entertain applications to the extent of 1733 houses for the agricultural population.

TUESDAY, FEB. 23RD.

Radium Research.

Sir ERNEST GRAHAM-LITTLE asked the Minister of Health if he would consider the advisability of promoting the formation of a committee of inquiry to take evidence and to report as to the best methods of forwarding radium research and advising as to the most useful application of the sums of public money subscribed for that purpose and at present in the custody of the National Radium Trust.—Sir E. HILTON YOUNG replied: My hon. friend will be aware that, as has already been stated in the House on several occasions, the Radium Trust and the Radium Commission are not appointed by the Minister of Health, but are constituted by Royal Charter. It is the duty of the Radium Commission under Article 7 of the Charter to make arrangements for the proper custody, equitable distribution and full use of the radium which may from time to time be the property of the Trust, with the object of promoting the treatment of the sick throughout Great Britain and the advancement of knowledge of the best methods of rendering such treatment and of securing due economy in the use of radium for the purposes of such treatment; [illegible] to them for the use of the ra[illegible] arrange the supply on loan [illegible] the radium or any preparations of it so as to enable proposals approved by them to be carried out. I have, therefore, in the first instance referred my hon. friend's suggestion to the Radium Commission for their consideration, and I will inform him of their views in due course.

Post-vaccinal Encephalitis.

Mr. GROVES asked the Minister of Health how many cases of, and deaths from, post-vaccinal encephalitis or other disease of the central nervous system following vaccination had been brought to the notice of his department since the adoption of the new vaccination regulations on Oct. 1st 1929.—Mr. ERNEST BROWN (Parliamentary Secretary to the Ministry of Health) replied: Since Oct. 1st, 1929 38 cases of suspected disease of the central nervous system following vaccination, including suspected cases of post-vaccinal encephalitis, have come to the notice of my department. Inquiries showed that in at least five of these cases the suspicion could not be verified. In 18 causes vaccination had been followed within a short period by the occurrence of a disease of the central nervous system without there being any reason to associate this disease with the antecedent vaccination. Of these 13 were fatal. There remain 15 cases in which the occurrence of post-vaccinal encephalitis was definitely established, and of these eight proved fatal.

Miners' Hours Convention.

Mr. MANDER asked the Secretary for Mines the present position with reference to the international convention for miners' hours.—Mr. ISAAC FOOT replied: His Majesty's Government is favourably disposed towards the Convention. The detailed application of some of its provisions to the coal-mines of this country presents certain problems which are under consideration. As soon as these points have been disposed of, the Government will be prepared to ratify the Convention provided that the other six countries will do so at the same time.

Gas Detectors in Coal-pits.

Mr. HANNON asked the Secretary for Mines when he proposed to undertake the experiment of the introduction of gas detectors into certain coal-pits; and if he would explain the process by which the proposed practical tests would be carried out.—Mr. ISAAC FOOT replied: I have asked the interests directly concerned—including the Mining Association and the Miners' Federation—to coöperate in organising and watching thorough pit trials on a working scale with an automatic firedamp detector. It is my hope that the scheme—which will require to be worked out carefully—will be settled by common consent, and discussions to that end will be conducted as speedily as possible.

DONATIONS AND BEQUESTS.—Among other bequests the late Mr. Henry Atkinson, of Birkenhead, left £500 each to the Liverpool Royal Infirmary, the Liverpool Southern Hospital, the Liverpool Northern Hospital, and the Liverpool Children's Hospital; £200 to the Liverpool Eye and Ear Infirmary and the School for the Blind, £1000 to Ulverston Cottage Hospital, and 4 per cent. of the residue, with a maximum of £400, to the Liverpool Cancer Fund.

NEWCASTLE INFIRMARY: REJECTION OF CONTRIBUTORY SCHEME.—By 24 votes to 16 the house committee of Royal Victoria Infirmary, Newcastle-on-Tyne, rejected a proposal for the establishment of a contributory scheme, the chairman remarking that up to the present the Infirmary had been able to meet fairly satisfactorily all the demands made upon it. The suggestion to put into force some scheme of compulsory contribution was warmly espoused by Sir Robert Bolam in a recent address to county hospital representatives, in which he pointed out that the workers in Northumbria were contributing directly about £130,000 towards the £300,000 spent annually on keeping up voluntary hospitals. Adding thereto the employers' contribution, which amounted to about 20 per cent. of that of the workpeople, there remained double that total to be raised by donations, subscriptions, and investments. He pleaded for equality of effort among those who ought to support hospitals, adding his own belief that the money to carry on and extend the services would not be forthcoming without compulsion. A contributory scheme would have the further advantage of facilitating interchange of patients among the different hospitals in the area.

OBITUARY

WILLIAM FREDERICK HASLAM, M.B., Ch.B. Birm., F.R.C.S. Eng.

ONSULTING SURGEON, BIRMINGHAM GENERAL HOSPITAL.

'E regret to announce the death on Feb. 18th at residence in Vicarage-road, Edgbaston, of Mr. iam Frederick Haslam, sometime professor of ery in the University of Birmingham, after a onged illness, at the age of 74.

rof. Haslam received his medical education at Thomas's Hospital Medical School, having viously been articled, in the old-fashioned manner, member of the surgical staff of the Royal Berkshire spital, Reading. He spent over two years at Reading, l as a student at St. Thomas's Hospital he soon tinguished himself by his aptitude for anatomy. became assistant demonstrator in the subject l gained the Cheselden medal in anatomy and gery. He qualified as M.R.C.S. in 1878, held the ual resident appointments at the hospital, and was de a prosector in anatomy at the Royal College Surgeons of England. In 1881 he obtained the llowship of the College, and in the following year was cted assistant surgeon at the Birmingham General spital.

For the rest of his professional life Prof. Haslam orked in Birmingham. At Queen's College, rmingham, he was appointed medical tutor in 1883, id in the following year demonstrator of anatomy, hich post he held till 1892. He became full surgeon the General Hospital in 1891, and held this position ll the end of the war, his term of office being prolonged despite the age regulation for retirement. His ork as a surgeon, always characterised by a proound knowledge of anatomy, was of a very sound rder, and his clinical teaching was practical and uch appreciated by the students. On the ormation of the University of Birmingham in 900 he was appointed lecturer in applied anatomy, hen lecturer in general surgery to the dental chool, and finally, in 1908, joint professor of urgery from 1913 to 1919. On retiring from the hair he accepted the post of dean of the medical aculty in the University, and held this office, together ith the lectureship in applied anatomy, until 1928. hroughout this long period of service he discharged he duties with a zeal and interest which were reflected the high opinion formed of him by his colleagues, ho on his retirement from active work made a resentation to him as "a token of affection and ratitude for valuable services to the medical and ental schools and the University during the period f 46 years—1882 to 1928." *The University Medical* ociety instituted at his retirement a Haslam Oration n memory of his long association with the medical chool.

Haslam was much esteemed outside his own niversity as an examiner, acting in this capacity or two periods, in anatomy, for the primary ellowship of the Royal College of Surgeons of ngland, while he examined in surgery at different imes for the Universities of London, Liverpool, Leeds, and Bristol. At the College of Surgeons he was a member of Council from 1908 to 1924, serving as vice-president for two years, and as chairman of the court of examiners. In 1911 he was Lettsomian ecturer at the Medical Society of London, and delivered a series of lectures upon operations for tone in the male bladder,* which were reported in our columns; but he was a quite infrequent contributor to medical literature.

Sir Gilbert Barling adds the following simple and sympathetic words upon his life-long colleague: "Haslam and I were associated for nearly fifty years in hospital and in university work. I do not think he had an enemy in the world; he was above all things loyal, kindly, and highly conscientious in his work. In the later period of his life, when he might well have left to one of his junior colleagues the urgency calls of night emergencies at hospital, he always insisted on attending to them himself, this not because he wished to deprive his juniors of experience but from a very high sense of duty. He was not so much marked as a dexterous operator—operation work was, I always thought, a considerable strain upon him—but he rose to the occasion when difficulties presented themselves, and he never did anything wild or rash. But his powers of diagnosis were excellent, and his opinion was often invited by his colleagues in difficult cases. As a teacher he was very methodical and effective, whether in the wards or in the anatomy rooms; in the latter he had the gift, not too common in these days, of adapting the parts of anatomy to their applications in surgery—a gift which made him very popular with students. For some time after he had retired from his hospital surgeoncy he continued his anatomical teaching greatly to the advantage of the school of medicine. As an examiner he was admirable both in the earlier and in the later subjects; his experience in this work was quite exceptional, and he really liked it—which can probably be said of few surgeons. His fairness, his desire to do justice to what the student knew, rather than to find out his weakest points, gave the victims under examination a sense of confidence and of fair treatment which brought out the best in them.

"For several years he was dean of the faculty of medicine in the University. The duties are not easy to carry out owing to the rather conflicting interests of the two main teaching hospitals, which are again somewhat aggravated by the dispersion of the teaching centres—*two hospitals apart from each* other and from the University buildings. Haslam's tact, his fairness and his integrity, secured a degree of harmony such as could have been attained by hardly anyone else; and his guidance of students, as well as of colleagues gathered around him a degree of affection of which any man might be proud.

"About four years ago he had a disabling illness which rendered him a complete invalid and at times gave him much distress. He bore his troubles with such dignity and courage as might be expected from him, having regard to the tenour of his life. May he rest in peace."

WALTER GEORGE SMITH, M.D. Dub., F.R.C.P. Irel.

Dr. Walter Smith, who died suddenly at his house in Merrion-square, Dublin, on Feb. 23rd, was formerly president of the Royal College of Physicians of Ireland, and also of the Royal Academy of Medicine in Ireland. He was King's professor of materia medica and pharmacy in the School of Physic, Trinity College, Dublin, from 1881 to 1920, and in this post he succeeded his father, Aquilla Smith, who had held the chair from 1864.

Walter Smith was educated at Trinity College, Dublin, taking an honours degree in experimental science in 1867. He graduated as M.B. in the same year, and as M.D. in 1870. In 1868 he was elected a Fellow of the King and Queen's (subsequently Royal) College of Physicians in Ireland, of which, after filling various other offices, he became president in 1892. To the end of his life he took great interest in the affairs of the College, and until a few months ago rarely missed one of its meetings. He was "Father of the College" since the death of John Mallet Purser a few years ago. His chair of materia medica carried with it the duty of physician to Sir Patrick Dun's Hospital. He was also for several years physician-in-ordinary to the Lord Lieutenant, Earl Cadogan.

Smith's professional life had two main interests—dermatology and chemistry. In both he attained distinction. His occasional communications dealing with dermatology were authoritative, and although he never limited his practice as a physician to that specialty, he always took a great interest in it. In early life he considered entering on an academic career as a teacher of chemistry, but circumstances did not favour this scheme. He was, however, an ardent student of chemistry all his life, and on his gradual withdrawal from practice in recent years chemistry became his main intellectual interest. Rarely did a session pass without his bringing a paper dealing with recent developments in chemistry before the Royal Academy of Medicine or the private medical club he was in the habit of attending. "His experience as a physician and his knowledge of chemistry made him an ideal teacher of materia medica," writes a colleague. "He succeeded in being both scientific and practical. His scientific outlook, his mind sharp to a degree of scepticism, freed that complicated subject from the entanglements of tradition and superstition which tended, more 40 years ago than to-day, to render it a pathless wild. As a clinical teacher his effect was stimulating rather than informative. He brought everything to the test of science and common sense; he hated sham of every kind, in himself as well as in others; authority appealed as little to him as did mere novelty; pomposity and pretence angered him. Withal he had a simple and genuine humanity which endeared him to his students."

Births, Marriages, and Deaths

BIRTHS.

HARE.—On Feb. 16th, at a nursing home, the wife of Major John Hare, O.B.E., R.A.M.C., of Radnor-place, W., of a daughter.

SMALLEY.—On Feb. 19th, at "Stockcroft," Malthouse-lane, Kenilworth, the wife of Leonard Smalley, M.B., M.R.C.S., of a son.

DEATHS.

BLACKMAN.—On Feb. 12th, at Poplar House, Portsmouth, Josiah Geo[illegible] ux., for nearly 50 years in medical [illegible]

FORDYCE.—On [illegible] ng home in Cambridge, Boston Elphinstone Fordyce, M.B., of Stirling-road, Bournemouth, aged 73 years.

HASLAM.—On Feb. 18th, at his residence, Vicarage-road, Edgbaston, Prof. William Frederick Haslam, M.B., B.Ch., F.R.C.S., aged 74.

KINDNESS.—On Feb. 16th, at his residence, Castle Hill-avenue, Folkestone, John Kindness, M.R.C.S., L.R.C.P., aged 49 years.

PRICHARD.—On Feb. 18th, at Almeley, Bodenham-road, Hereford, from pneumonia, following typhoid, John Augustin Prichard, M.R.C.S., L.R.C.P.

SMITH.—On Feb. 16th, at Merrion-square, Dublin, Walter George Smith, M.D., F.R.C.P.I., ex-President Royal College of Physicians, Ireland, in his 88th year.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

MEDICAL NEWS

University of London.

At a meeting of the Senate on Feb. 17th the William Julius Mickle Fellowship for 1932 was awarded to Mr. Philip Eggleton, D.Sc., for his research on the labile compounds of phosphorus in muscle.

The title of Fellow of University College, London, was conferred on Mr. Harold John Channon, D.Sc., Johnston Professor of Biochemistry in the University of Liverpool; Dr. Henry Albert Harris, professor of clinical anatomy at University College and University College Hospital Medical School; and Mr. Herbert Tilley, late surgeon to the ear, nose, and throat department of University College Hospital. The title of Honorary Fellow of the University College, London, was conferred on Sir Edward Hilton Young, Minister of Health.

University of Edinburgh.

The Cameron prize for 1932 has been awarded to Dr. Edward Mellanby, F.R.S., professor of pharmacology in the University of Sheffield. The prize, whose value is about £200, is awarded annually for additions made to practical therapeutics during the previous five years.

University of Manchester.

Dr. J. F. Wilkinson, director of the laboratory of clinical investigations, has been appointed lecturer in systematic medicine, and Dr. Allan Taylor demonstrator in anatomy. Dr. J. M. Yoffey has resigned his appointment as assistant lecturer in anatomy on his appointment as lecturer in anatomy in the University College of South Wales and Monmouth.

Pharmaceutical Society of Great Britain.

At a meeting to be held at 17, Bloomsbury-square, London, W.C., at 8.30 P.M., on March 8th, Mr. Frank Wokes will give an address on the Importance of Ergot in Pharmacy.

Gresham College.

Four lectures on Great English Doctors and their Message will be given by Sir George Newman at Gresham College, Basinghall-street, London, E.C., at 6 P.M., on March 1st, 2nd, 3rd, and 4th.

Dr. Alfred Cox Testimonial Fund.

A communication has been sent out by the committee of this fund to the chairmen, secretaries of the divisions, and representatives of the British Medical Association, asking that as many names as possible should be added to the list of subscribers, so as to make that list a complete one of the Association.

Society of Radiographers.

The eleventh annual dinner of the Society was held at Pritchard's Restaurant on Friday last, Feb. 19th, Mr. Cyrus L. Winch, the president of the Society, being in the chair. The main toast of the evening, the "Prosperity of the Society," was proposed by Dr. A. E. Barclay, president of the British Institute of Radiology (B.I.R.), who referred in obstetric terms to the dates of origin of the Rontgen Society and the British Association for the Advancement of Radiology and Physiotherapy and their amalgamation as the B.I.R. in 1927, in which year the Society of Radiographers, founded seven yea[illegible] became also affiliated to the B.I.R., though [illegible]ntity. Dr. Barclay congratulated th[illegible]aphers on an increasing membership and the intention to maintain a high standard of entrance. Mr. Winch replied setting out well the inter-relations which should exist between radiographers and radiologists, alluding to the former as the head and the latter as the limbs of a joint pursuit of beneficent knowledge. The toast of the "Guests and Visitors" was proposed by Mr. C. W. Furby and replied to from different angles by Dr. H. A. Harris, professor of clinical anatomy in University College, London, and Dr. Cecil Teall, president of the [illegible]raphic Society. Dr. Teall pointed out the [illegible] to be derived from the development o[illegible]ursuit of their joint science in the large provincial centres, while Professor Harris was both instructive [illegible] the necessity for the insistence upon [illegible]ards of entrance. With regard to [illegible] Harris pointed out that their utility was [illegible] enhanced if they were well conducted, paying here a great tribute to the work at the English Conjoint Board of Sir Frederick Hallett, whose organisation of examinations he considered to constitute a model, rendering the task of the examiner less harassing, while assuring for the examinee "a square deal." Mr. C. E. A. Bedwell, house governor of King's College Hospital, also replied, and the evening closed with an entertainment consisting of an amusing dialogue by Messrs. Clapham and Dwyer.

National Temperance Hospital.

e "London" has now been re-named the "National" perance Hospital.

ruction for D.P.M.

om the London County Council we have received a bus of lectures and practical courses of instruction to iven at the Maudsley Hospital from the beginning of h onwards, intended primarily for candidates for a ma in psychological medicine. Particulars of these other facilities for instruction may be had from the tor of the Central Pathological Laboratory, Maudsley ital, Denmark-hill, London, S.E. 5.

essional Nursing, Midwifery, and Public Health nference.

the first day of this conference, which is to be held e New Horticultural Hall, Westminster, S.W., from 29th to March 4th, addresses on the following among subjects will be given: THE LANCET Commission rsing, by Mr. Bradford Hill, D.Sc. (2.30 P.M.); Bookings t-patients, by Miss G. M. Wortley: Hospital Organisa- by Mr. Godfrey Hamilton.

Physics Building at Leeds.

t week Sir William Bragg opened the new physics ing of Leeds University, which has been provided at of £60,000. Sir William, who was formerly Cavendish sor at Leeds, recalled that in the old building researches een made which had opened the way to discovery e world over. There Stroud had produced the range- the first measurements of X ray spectra were made , and the first observations were recorded which mined the structure of crystals.

L.C.C. and the Nursing Commission's Report.

last week's meeting of the London County Council, ral Cuthbert Hunter asked the chairman of the central health committee whether, in view of the report of LANCET Commission on Nursing, she would consider, llaboration with the education committee, the desir- of training girls for the nursing profession from the f 16, and so enable girls leaving central schools to their training without any break in their education? arrie Lambert stated, in reply, that the final report Commission would be before the central public health ittee on Feb. 25th, and the committee would, she pated, ask the medical officer of health to report to fully on the subject of the Commission's recommenda- With regard to the particular point raised by Admiral r, as to taking girls at the age of 16 for training for tioner nurses, this question, she said, had for some been, and still was, under consideration by the com- .

sh Social Hygiene Council.

eeting of this Council was held on Feb. 16th in London, Sir Basil Blackett, the president, in the chair, to receive ort from the executive. The report evidenced the sion of the Council's work and its increased coöperation allied societies. The voluntary and other economies time were mentioned, the chairman remarking that ss of the block grant was not wholly a disadvantage; illors, now approached personally, had had their st practically awakened. A book, "Preparation for age," has been compiled and will soon be on sale, and to girls in preparation for marriage is to be given bureau to be opened with the approval of the Council. ouncil's two new films were cordially approved. Sir m Beveridge addressed the meeting on the aim of ritish Broadcasting Corporation in issuing its "Family n."

fields Dinner.

annual dinner of past and present students of the London Ophthalmic Hospital was held at the Langham , London, on Feb. 11th, when Sir William Lister led, and among those present were Sir Harold Fawcus, Admiral St. G. S. Bond, Sir Peter Chalmers Mitchell, rnold Lawson, K.B.E., Mr. Theodore Luling (chairman e hospital), Dr. Gordon Holmes, and Mr. Treacher s. The "Hospital and Medical School," proposed by hairman, was responded to by Mr. Luling and Mr. es Goulden, dean of the school. In submitting his al report, the dean said there were 161 students attend- e hospital, of whom 77 were new. Moorfields students nted for 31 of the 38 successful candidates for the almic diploma of the Conjoint Board. For the Oxford ma 5 of the 7 successful candidates came from Moor- . During the year also 3 students had obtained the S. Edin. The enlargement of the out-patient depart- and medical school proposed two years ago were, id, now likely to be put in hand, giving even better ties for teaching.

Devonshire Hospital, Buxton.

Sir Humphry Rolleston, Regius professor of physic in the University of Cambridge, has been elected president for 1932–33 of the Devonshire Hospital for Rheumatic Diseases, Buxton.

Maternity Block at West Middlesex Hospital.

On Wednesday last week the Queen opened the new maternity block and electrical treatment department at the West Middlesex county hospital, Isleworth, which was opened by the Duchess of Teck, her mother, in 1897. It is a two-floored building with maternity wards, nursery, infants' sun-rooms and bathing-rooms, labour-room, and glazed verandahs. The antenatal department has a separate entrance, and the theatre is on the ground floor.

Appointments

CRAMERI, P. V., L.R.C.P. Lond., M.R.C.S., has been appointed Certifying Surgeon, under the Factory and Workshop Acts, for New Southgate, Middlesex.

Medical Referees under the Workmen's Compensation Act: BROCKMAN, R. ST. L., M.Ch. Camb., F.R.C.S. Eng. (Doncaster and East Retford); GALLOWAY, T. McL., F.R.C.S. Edin. (Clackmannan County).

Vacancies

For further information refer to the advertisement columns.

Aberdeen Royal Mental Hospital.—Jun. Asst. Phys. £300.

All Saints' Hospital, 91, Finchley-road, N.W.—H.S. At rate of £150.

Antrim Mental Hospital, N. Ireland.—Res. Med. Supt. £800.

Ashton-under-Lyne District Infirmary.—H.S. At rate of £150

Birmingham, Maternity and Child Welfare Dept.—Res. M.O. £250.

Blackburn, Calderstones (Certified Institution for Mental Defectives) Whalley.—Asst. M.O. £500.

Bootle Ge —Hon. Orthopædic Surgeon.

Bradford At rate of £135.

Brighton sst. School M.O. and Asst. to th

Bristol E Surgeon.

British M Med. Secy. £800.

Cambridge, Addenbrooke's Hospital.—Three H.S.'s to Special Depts. Each at rate of £130.

Cancer At rate of £100.

Cardiff, *al Memorial Associa tior*

Cardiff r. £200. Also H.P. At rate of £50.

Charing Cross Hospital, Strand, W.C.—Surg. Reg. £150. Also Obstet. Reg. £100.

Croydon General Hospital.—Hon. Asst. P.

Durham County Hospital.—Two H.S.'s. Each £150.

East Ham Memorial Hospital, Shrewsbury-road, E.—H.P. and H.S. and Cas. O. At rate of £150 and £120 respectively.

Exeter, Royal Devon and Exeter Hospital.—Cas. O. and H.S. to Spec. Depts. At rate of £150.

Great Barrow, Nr. Chester, East Lancs., Tuberculosis Colony.—Asst. M.O. At rate of £275.

Greenwich, Dreadnought Hospital.—H.P. and H.S. Each at rate of £110.

Halifax, St. Luke's Hospital.—Sen. Res. M.O. £350.

Harrogate Infirmary.—Jun. H.S. £140.

Hertford County Hospital.—H.S. At rate of £200.

Hospital for Sick Children, Great Ormond-street, W.C.—Cas. O. £400.

Hospital for Tropical Diseases, Endsleigh-gardens, W.C.—H.P. At rate of £150.

Hove, Lady Chichester Hospital.—Jun. H.P. At rate of £50.

Ipswich, East Suffolk and Ipswich Hospital.—H.S. and H.P. Each £120.

King's College Hospital, Denmark-hill, S.E.—Jun. Surg. to Ear, Nose, and Throat Dept.

Leicester Royal Infirmary.—H.S. and H.P.'s. Each at rate of £125.

M.O. £100.

spital.—Second Asst. M.O. £425.

an-street, W.—Surg. Reg. £100.

-road, W.—Surg. Reg. £100.

Park Place, Cheetham Hill-road.

Manchester, Royal Children's Hospital, Pendlebury.—Res. M.O. At rate of £125.

Manchester, Royal Children's Hospital, Gartside-street.—Two Asst. M.O.'s. Each at rate of £150.

Manchester Royal Infirmary.—Med. Reg. to Out-patients. At rate of £150.

Miller General Hospital, Greenwich-road, S.E.—Res. Surg. O. and Reg. £250. Also H.P. £150. Also Anæsthetist. 52 gns.

National Hospital for Diseases of the Heart, Westmoreland-street, Marylebone, W.—Res. M.O. Also Out-patient O. At rate of £150 and £125 respectively.

ospital for Sick Children.—H.P. Also s. Each at rate of £100.

Hospital, Edmonton.—Jun. Res. Asst.

Nottingham City Mental Hospital.—Second Asst. M.O. £100.

Oxford, Pembroke College.—Theodore Williams Medical Scholarship. £100.
Portsmouth Royal Hospital.—H.S. At rate of £130.
Prince of Wales's General Hospital, Tottenham, N.—Sen. and Jun. H.P.'s and H.S.'s. At rate of £120 and £90 respectively.
Princess Louise Kensington Hospital for Children, St. Quentin-avenue, N. Kensington, W.—H.P. At rate of £75.
Queen's Hospital for Children, Hackney-road, E.—H.P. and Cas. O. Each at rate of £100
Richmond, Sur [illegible] Jun. H.S. At rate of £100.
Rotherham Hos [illegible]
Royal London [illegible] *City-road, E.C.*—Two Out-patient Of [illegible]
Royal Nationa [illegible] *234, Gt. Portland-street, W.* H.S. At [illegible] 2 H.S.'s for Country Branch, Brockley H [illegible] of £150.
Royal Northern [illegible] 's. M.O. £200.
St. John's Hospi [illegible] *49, Leicester-square, W.C.*—Out- [illegible] Each £50.
St. Leonards-on-Sea, Buchanan Hospital.—Jun. H.S. At rate of £125.
St. Peter's Hospital for Stone &c., Henrietta-street, Covent Garden, W.C.—H.S. At rate of £75.
St. Thomas's Hospital.—Ophth. Reg. and Refractionist.
Salford Royal Hospital.—Res. H.S.'s to Special Depts. Each at rate of £125.
Sheffield, Jessop Hospital for Women.—H.S. At rate of £100.
South Metropolitan Gas Co., Old Kent-road, S.E.—Chief M.O. £1000.
Southend-on-Sea New General Hospital.—Hon. Surgeons and Physicians, &c. Also Res. M.O. £400.
Southern Rhodesia Medical Service.—Asst. and Relieving Govt M.O. £500.
Swanley, Kent, Hospital Convalescent Home, Parkwood.—Res. M.O. At rate of £200.
Walsall General Hospital.—H.P. and Res. Pathologist and H.S. Each at rate of £150.
West Riding of Yorkshire County Council.—School Med. Inspectors. £500.
Wigan, Royal Albert Edward Infirmary.—Three H.S.'s Each at rate of £150.
Wolverhampton Royal Infirmary.—Res. Asst. S. £250. Also H.S. to Ear, Nose, and Throat Dept. At rate of £100.

The Home Secretary gives notice of a vacancy for a Medical Referee under the Workmen's Compensation Act (1925) for the Sheriffdom of Lanark, and that it is proposed to appoint a *surgeon* to fill the vacancy. Applications from *Surgeons* should be addressed to the Private Secretary, Scottish Office, Whitehall, London, S.W.1, and should reach him not later than March 15th, 1932.

Medical Diary

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES

ROYAL SOCIETY OF MEDICINE, [illegible]
TUESDAY, March 1st.—8 P.M., [illegible] Followed by Mr. J. P. Hosford and Mr. E. P. Brockman. SURGERY. Members of this section are *specially invited to attend.*
WEDNESDAY.—5 P.M., HISTORY OF MEDICINE. *Paper:* Dr. [illegible] The History of the Introduct [illegible] to Medicine. Speakers: Sir [illegible] Sir [illegible] Dr. T. Izod Bennett, a [illegible] SURGERY. Short Pap [illegible] D. W. C. Northfield: [illegible] about the Elbow. M [illegible] of Head of the Radi [illegible] thelioma of Lymph N [illegible] Exposure of t [illegible]
THURSDAY.—8 P.M., [illegible] Paper: Dr. [illegible] Belgian Congo [illegible] of African Natives as Medical Assistants.
FRIDAY.—10.30 A.M., OTOLOGY. (Cases at 9.30 A.M.) Papers and slides: Dr. A. de Kleyn and Dr. A. Gray: A Case of Bilateral Acoustic Tumour. Dr. A. Gray: *Pathological Changes in the Auditory Nerve.* Cases and specimens. 5 P.M., LARYNGOLOGY. (Cases at 4 P.M.) Discussion: The Treatment of Suppurating Maxillary Sinusitis. Openers: Mr. W. M. Mollison Mr. A. J. Wright. Paper: Dr. Douglas Guthrie: The Operative Closure of *Oromaxillary Fistula.* Cases and *specimens.* 8.30 P.M., ANÆSTHETICS. Paper: Dr. C. W. Morris: Anæsthesia for Major Throat Operations. LARYNGOLOGY. Members of this Section are specially invited to attend.

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W.
MONDAY, Feb. 29th.—9 P.M., Mr. F. A. Williamson-Noble: *The Reactions of the Eye to General Disease.* (First Lettsomian lecture.)

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF PHYSICIANS, Pall Mall East, S.W.
TUESDAY, March 1st.—5 P.M., Dr. L. J. Witts: Pathology *and Treatment of Anæmia.* (First Goulstonian lecture.)
THURSDAY.—5 P.M. (Second Goulstonian lecture.)

GUY'S HOSPITAL, London Bridge, S.E.
MONDAY, Feb. 29th.—5 P.M., Dr. A. F. Hurst: Use of X Rays in Physical Diagnosis.

ROYAL NORTHERN HOSPITAL, Holloway-road, N.
TUESDAY, March 1st.—3.15 P.M., Dr. E. G. B. Calvert: *Practical Points: Cases of Diabetes, Nephritis, and Goitre.*

UNIVERSITY COLLEGE HOSPITAL MEDICAL SCHOOL, University-street, W.C.
TUESDAY, March 1st.—5.15 P.M., Dr. Dorothy Russell: Intracranial Tumours.

CHARING CROSS HOSPITAL MEDICAL SCHOOL.
SUNDAY, Feb. 28th.—10.45 A.M., Mr. H. E. Batten: Flat Foot. 11.45 A.M., Dr. A. A. W. Petrie: Diagnosis and Treatment of General Paralysis of the Insane.

NATIONAL HOSPITAL, Queen-square, W.C.
MONDAY, Feb. 29th.—2 P.M., Dr. Riddoch: Out-patient Clinic. 3.30 P.M., Dr. Kinnier Wilson: Epilepsy.
TUESDAY, March 1st.—2 P.M., Dr. Walshe: Out-patient Clinic. 3.30 P.M., Dr. Carmichael: Myasthenia.
WEDNESDAY.—2 P.M., Dr. Martin: Out-patient Clinic.
THURSDAY.—2 P.M., Dr. Kinnier Wilson: Out-patient Clinic. 3.30 P.M., Dr. Gordon Holmes: Symptoms of Cerebellar Disease.
FRIDAY.—2 P.M., Dr. Adie: Out-patient Clinic. 3.30 P.M., Dr. Carmichael: Myopathy.

KING'S COLLEGE HOSPITAL MEDICAL SCHOOL, Denmark-hill, S.E.
THURSDAY, March 3rd.—9 P.M., Mr. V. E. Negus: Diseases of the Œsophagus.

SOUTH-WEST LONDON POST-GRADUATE ASSOCIATION, St. James' Hospital, Ouseley-road, Balham.
WEDNESDAY, March 2nd.—4 P.M., Dr. E. Young: Treatment of Gastric and Duodenal Ulcer by Duodenal Feeding.

ST. MARK'S HOSPITAL, City-road, E.C.
THURSDAY, March 3rd.—4.30 P.M., Mr. L. E. C. Norbury: The Sigmoidoscope and Some of Its Uses.

LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital, 49, Leicester-square, W.C.
TUESDAY, March 1st.—5 P.M., Dr. W. Griffith: Eczema (1).
THURSDAY.—5 P.M., Dr. W. Griffiths: Eczema (2).

CENTRAL LONDON THROAT, NOSE, AND EAR HOSPITAL, *Gray's Inn-road*, W.C.
FRIDAY, March 4th.—4 P.M., Mr. A. L. Yates: Indications for Removal of Tonsils.

HAMPSTEAD GENERAL AND NORTH-WEST LONDO HOSPITAL.
WEDNESDAY, March 2nd.—4 P.M., Dr. H. C. Gage: X Ray Diagnosis of Diseases of the Alimentary Tract.

ST. PETER'S HOSPITAL, Henrietta-street, W.C.
WEDNESDAY, March 2nd.—3 P.M., Mr. A. C. Morson: Infections of the Urinary Tract.

ROYAL INSTITUTE OF PUBLIC HEALTH, 37, Russell-square, W.C.
WEDNESDAY, March 2nd.—4 P.M., Demonstration at Red Cross Centre, Peto-place, Regent's Park, N.W.

NATIONAL COUNCIL FOR MENTAL HYGIENE.
WEDNESDAY, March 2nd.—5.30 P.M. (at 11, Chandos-street, W.), Mr. T. A. Rodger: A Vocational Psychologist at Borstal.

GRESHAM COLLEGE, Basinghall-street, E.C.
TUESDAY, March [illegible] WEDNESDAY, THURSDAY, and FRIDAY [illegible] Newman: Great English Doct [illegible] (Lantern lecture.)

ANCOATS HOSPITAL, Manchester.
THURSDAY, March 3rd.—4.15 P.M., Mr. E. E. Hughes: Hydronephrosis.

MANCHESTER ROYAL INFIRMARY.
TUESDAY, March 1st.—4.15 P.M., and following FRIDAY at the same hour: Clinical Cases in the Wards.

MANCHESTER ROYAL INFIRMARY.
TUESDAY, March 1st.—4.15 P.M., Mr. H. H. Rayner: Symptoms of Gastric Diseases; Their Significance an Constancy.
FRIDAY.—4.15 P.M., Mr. J. Morley: Demonstration of Surgical Cases.

SALFORD ROYAL HOSPITAL.
THURSDAY, March 3rd.—Mr. E. D. McCrea: Pneumothorax Demonstration.

ST. MARY'S HOSPITALS, Manchester.
FRIDAY, March 4th.—4.15 P.M. (at the Whitworth-street West Hospital), Dr. Dougal and Dr. Brentnall: Antenatal Demonstrations.

LOCK HOSPITAL, Glasgow.
WEDNESDAY, March 2nd.—4.15 P.M., Dr. David Watson: *Venereal Diseases (Female).*

NOTES, COMMENTS, AND ABSTRACTS

ECONOMIES IN PRESCRIBING.

> "There can be no doubt that we doctors unintentionally very often involve our patients in xpenses which represent an unnecessary export f our money abroad, and are, from the medical point of view, quite superfluous."

ıs quotation, taken from a paper by the regian pharmacologist, Prof. E. Poulsson, in *skrift for den Norske Laegeforening* for Feb. 1st, mptomatic of the world-wide agitation against rts and in favour of reduction of expenditure. in the territory of each Great Power, the money by the manufacturing chemist is, so to speak, in the family. In the smaller States, on the hand, the popular drugs with protected names to a large extent to be imported, chiefly from ıany. According to the fashionable economic ine, medical men in these countries have a le incentive to economise by prescribing drugs r their chemical instead of their trade names. Prof. Poulsson points out, only a few decades the new pharmacological impulses usually came university laboratories unconcerned with the nercial side of the matter. At the present time place of these laboratories is in this direction taken more and more by the large chemical ries possessed of far greater material resources often equipped with first-rate facilities for rimental research in laboratories staffed by alists who coöperate on a sound footing with itals and similar institutions. After years of rch and clinical tests a new drug, if it proves factory, is put on the market at as high a price ommercial considerations allow, and the process anufacture is patented for a certain number of s, 18 for example. If the drug is really valuable, profit from such a monopoly with a time limit ell earned. The situation is somewhat different the protected name. the monopoly of which no time limit. A drug whose simple chemical position has long been known, and whose pretion is perfectly easy, can be given a plausibly estive new name and foisted on the public ıeans of intensive propaganda.

ten the difference between the prices of one and same drug sold under a protected name and its ical name is enormous. In the 1930 edition the "Arzneiverordnungsbuch der Deutschen ıeimittelkonmission," a commission on which German Society for Internal Medicine, the nan Pharmacological Society, and other important es are represented, a table is published comparing prices for a given weight when sold under this or name. A few examples may be given here.

ıtity nmes.	Protected name.	M.	Chemical name.	M.
0	Antipyrine	0·70		0·50
0	Atophan	4·40		1·20
1	Diuretin	0·20		0·05
1	Hetol	0·50	Sod. Cinnamas	0·10
1	Protargol	0·35	Argent. Proteinic	0·10
1	Urotropine	0·40	Hexamethylene-tetramine	0·05
1	Veronal	0·45	Acid. Diethyl-barbituric	0·10

Price in marks when sold under—

en as much as 3 g. a day have to be taken the ent may have to discontinue a valuable remedy ply because his medical adviser has not troubled rescribe the drug at the cheaper rate.

hemical titles are often difficult to memorise, and his connexion it may be recalled that in 1905, he Conférence Internationale pour l'Unification de Formule des Médicaments Héroïques, held in ssels, the suggestion was made that an international pharmacological body should be created, of whose duties should be to give short names to gs whose scientific names are too long. These rt names must, of course, be in their turn proed lest a commercial concern should corner them. s idea has been favourably received in certain quarters; as an example we may mention the name barbitone given to diethyl-barbituric acid in the British Pharmacopœia.

Prof. Poulsson quotes Nottebaum as having calculated that in Germany the sickness insurance funds are taxed to the tune of 50 million marks a year for superfluous drug bills. Quoting Trendelenburg, he refers to the host of trade synonyms for one and the same substance; for adrenalin there are 29 such synonyms, for the posterior lobe of the pituitary body there are 34, for the thyroid there are 31, and for digitalis a modest 41. In Norway a pharmacological commission is at present studying this problem, and it is significant that each member of this commission has received from an important trade organisation in Germany a communication in which it is suggested that the protected names of drugs mentioned in the Norwegian pharmacopœia should be unaccompanied by their chemical synonyms. The idea that doctors and chemists should be kept in ignorance of the scientific names of drugs sold under a protected name was unanimously and without discussion rejected by the commission.

TEACHERS OF THE DEAF.

FROM the National Institute for the Deaf, Mr. A. J. Story writes:—"This Institute receives frequent enquiries from deafened persons for teachers of lip-reading, and some also from hearing persons who desire to be trained as teachers of this subject. It has also been represented to us that some who have leisure may desire to train in order to help the deafened in their district as a voluntary social service, while others not so favourably circumstanced may wish to teach professionally. We shall be glad to hear from any who are seriously interested in this matter. It is essential that those who teach the deaf should themselves have unimpaired hearing, should be of bright and active personality, and have received a good education. If sufficient numbers are forthcoming, this Institute will arrange short courses of training for teachers of this subject. The proposed courses will not qualify for teaching deaf and dumb or deafened children of school age, nor for service in schools or institutions under the Board of Education."

The address of the Institute is 2, Bloomsbury-street, London, W.C. 1.

THE PHYSIOLOGY OF MUSCLE AND NERVE.

THE advance in knowledge of the physiology of muscle and nerve has depended very largely on the invention of delicate apparatus. This has been wonderfully improved since G. J. Burch adapted the capillary electrometer and enabled Francis Gotch to get a record of the passage of a single impulse along a nerve. With modern galvanometers, amplifiers, and loud speakers, what was then demonstrated with difficulty and imperfectly can now make as much noise in the world as anyone cares to hear. Mr. Matthews gives in a handy volume [1] an account of the substantial progress made by Prof. E. D. Adrian and himself in the study of the nature of the nervous impulses which arise in consequence of artificial and natural stimulation. He adds short discussions on some of the relations of the body to electricity and on some aspects of the special senses. As a piece of popular scientific exposition the book is not very successful. It makes the fundamental mistake of appealing to the wonder and emotions of the reader rather than to his intelligent interest. In places, too, the physiology is unsound; it is misleading, for instance, to state without qualification (p. 27) that it is the nervous system which is responsible for the coördinated activity of the various parts of the body.

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[1] Electricity in our Bodies. By B. H. C. Matthews, M.A., Fellow of King's College, Cambridge. London: George Allen and Unwin. 1931. Pp. 108, 19 figures. 4s. 6d.

SIR BENJAMIN WARD RICHARDSON.

In a Chadwick lecture on Sir Benjamin Ward Richardson, delivered in London on Feb. 18th, Dr. J. D. Rolleston said that although it was little more than 35 years since Richardson's death, his valuable contributions to public health, his work, and even his name were little known to the present generation. He was born in 1828 at Somerby, in Rutlandshire, and after a varied experience as assistant to country practitioners, qualified at Glasgow in 1850. He subsequently came to London, and at the early age of 30 was already well known in the medical profession. His time was henceforth divided between consultant practice, laboratory research, especially in connexion with anæsthetics, delivery of lectures, and literary work, in which he was engaged until two days of his death in 1896. In 1867 he was elected F.R.S., and in 1893 he was knighted. He was the founder and editor of the first two journals in this country devoted to public health—viz., the *Sanitary Review and Journal of Public Health* (1855–59), and the *Social Science Review* (1864–66). In addition to biographies of eminent medical men or natural philosophers, which were published separately in 1901 under the title of "Disciples of Æsculapius," and clinical and experimental studies, the 12 volumes of the "Asclepiad" (of which the first appeared in 1862 and the remainder were published quarterly between 1884 and 1895, and were entirely written by himself) contained numerous articles dealing with various aspects of hygiene.

Richardson was one of the founders of the Epidemiological Society of London, took an active part in the proceedings of the Sanitary Inspectors' Association, and in 1882 founded the Model Abattoir Society. His lectures and addresses covered a wide field, including such subjects as a model city of health, dress in relation to health, woman as a sanitary reformer, national main drainage, and the healthy culture of the literary life. In 1878 he first made the proposal, which was not realised until 23 years after his death, for the establishment of a Ministry of Health. His most important lectures and addresses were those dealing with alcohol, in the scientific campaign against which he was a pioneer.

OFFICIAL YEAR BOOK OF LEARNED SOCIETIES.

The forty-eighth annual issue of this year book is much reduced in bulk owing to omission of the "Lists of papers read" at the various scientific and learned socieites which has been a feature of previous issues. This has enabled the publishers (Messrs. Charles Griffin and Co., Ltd.) to reduce the price of the book from 18*s.* to 10*s.*, and this should bring it within the reach of a wider circle of subscribers. The information contained has been checked by the officers of societies and departments concerned, and the year book can be relied on as a safe and comprehensive work of reference. The volume should be on every editorial table and on the shelves of every public library.

THE CARE OF SOLDIERS' FEET.

A small monthly magazine is issued in Germany at about a shilling, called *Kriegskunst*, which we may translate as "practical points about war," for the instruction of "other ranks." It gives instruction on map-reading, stories of gallant deeds and pictures of notable soldiers, and suggests how to deal with emergencies such as leaders of small parties must always be prepared for. Its pictures, "right and wrong," interest us most. Usually there are a dozen pairs of these, illustrating, for instance, the right and the wrong ways of climbing hills in snow, of training war-dogs, or of loading horses on trains. One of these series [1] is concerned with the care of the feet. It is wrong, says the instructor, to throw oneself carelessly on the ground at a halt on a route march, for the purpose of a halt is the care of the feet, when the malicious little demon (shown) who has put a pebble in one's boot can be sidetracked. How boots should and should not be dried is pictured, and the right and the wrong way of cutting toenails. These pictures may profitably be examined by those who are providing training manuals for the troops, for they tell in a moment what would otherwise need three lines of print, and, besides, the lessons are more easily memorised. Dissatisfied faces appear on the soles of the ill-used feet, whose owners are evidently among the less creditable of the soldiers delineated in the series.

AN EAST-END CLUB OPEN TO NURSES.

Mrs. B. L. Q. Henriques writes from the Bernhard Baron St. George's Jewish Settlement, Berner-street, Commercial-road, E.1:—"It may be of interest to those of the nursing profession attached to hospitals in the S.E., E.C., and E. districts of London to know that these beautifully equipped and comfortable premises are at their disposal for the purpose of a recreational club during off-duty time. The object of the club is to provide facilities for every sort of pastime for nurses, without any expense to them beyond a very small annual associate's fee. The club (which is already used by one hospital) is open daily from 9 A.M. to 5.30 P.M., thereby making it of use to both day and night nurses. The following are some of the activities available:—

Gymnastics, dancing, roller-skating, netball, badminton, deck-tennis, ping-pong, chess and draughts, reading-room, lending library, sewing-room, laundry, piano and violin practice, organ practice, glee singing, talks on art and music, and dramatic and debating section.

The changing-room, shower baths, &c., are available, as well as the common-room, garden, roof-playground and picture gallery which are open to members of the club. The restaurant and canteen may also be used.

The matrons of the various institutions within the radius are being notified of this scheme. It is hoped that the club will fill the need for a centre to which nurses can go for rest and recreation within reasonable distance of their hospitals, returning to them refreshed and with renewed vigour and inspiration. Application for membership should be made to me at the above address."

A FRAUDULENT YOUNG PERSON.

We understand that members of the medical profession are being approached by a correspondent named sometimes Millicent E. Aldridge and sometimes Mary Beale, the alleged reason for seeking pecuniary assistance being that she is awaiting an allowance from New Zealand, while she claims to be the daughter of a doctor. We understand that her correspondence is profuse, which accounts perhaps for the slip which allowed her to make identical applications for aid to the Royal Medical Benevolent Fund under her two different signatures, applying to the Fund personally as Mary Beale "on behalf of her father Dr. Thomas Beale," and to a member of the committee of the Fund in the same words as Millicent Aldridge. This led to the Fund bringing the matter before the Charity Organisation Society, whose information is clear, stating that the applicant for help is a young woman, a notorious begging letter writer, with the real name of Jean Atherton. The Society strongly urges all who are approached by her to immediately communicate with the police.

Croydon Hospital Nurses' Home.—Lady Brown, wife of Sir Robert Brown, chairman of Croydon Hospital, recently opened the Charles Heath Clark memorial home for nurses in connexion with the hospital. The home was formerly three houses which have been bought and reconstructed at a cost of £20,000, one-half of which has been contributed by the executors of Mr. Clark, who was twice mayor of Croydon. There are 51 bedrooms.

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[1] Kriegskunst im Wort und Bild (Bendlerstrasse, 8, Berlin W.10), October, 1931.

ADDRESSES AND ORIGINAL ARTICLES

THE PATHOLOGY AND TREATMENT OF ANÆMIA.

BY L. J. WITTS, M.D. MANCH., F.R.C.P. LOND.,
ASSISTANT PHYSICIAN TO GUY'S HOSPITAL; WILL EDMONDS CLINICAL RESEARCH FELLOW.

LECTURE I.

THE ERYTHRON IN HEALTH AND DISEASE.*

> "As regards the relative value of clinical and post-mortem observation in the diagnosis of cases of anæmia of doubtful nature, there is in my experience no doubt. For purposes of diagnosis I would rather see a case of severe anæmia during life than base my diagnosis on any blood changes or other features that might be presented in the form of reports."
>
> WILLIAM HUNTER, 1923.

THE original duty of the Goulstonian lecturer was to dissect the body and to demonstrate his dissections. In the same spirit I shall try to draw a simple picture of that interesting tissue which is constituted by the red blood-cells and their precursors, and to give examples of its reactions in health and disease. Boycott has suggested the term *erythron* to comprise the circulating red blood-cells and the cells from which they arise. This term is valuable not only because of its brevity, but also because it emphasises the functional unity of the red cells and their precursors. The erythron may be aptly compared with an organ such as the skin. Just as in the skin we recognise the strata germinativum, mucosum, granulosum, lucidum, and corneum, so in the erythron we must think of the primitive cells evolving through megaloblast, normoblast, and reticulocyte to the mature erythrocyte. The interstitial tissue of the erythron is represented by the plasma, and by the fat and reticulum of the bone-marrow. Few people have a conception of the size of the erythron. The volume of the marrow cavity is estimated at 1400 c.cm., the total volume of the circulating blood at 4000 to 8000 c.cm. Even when no account is taken of the plasma, the size of the erythron can hardly be less than 2500 c.cm., so that it is an organ considerably larger than the liver. Escaping from the vessels at autopsy, or lying hidden in the recesses of the bones, it has too often escaped the attention of the morbid anatomist, and the pathology of the erythron remains to be written.

Boycott has shown that the erythron may, like other organs, undergo atrophy or hypertrophy, the one from increase of the oxygen tension, the other from its diminution, and he regards Osler's disease, polycythæmia rubra, as an obscure hyperplasia or perhaps a veritable tumour of the erythron. Following his lead we may speak of the congenital dystrophies of the erythron, the best known of which is acholuric familial jaundice, in which an abnormal and fragile corpuscle is transmitted from generation to generation. Less familiar to us but of the same hereditary type are the sickle-cell anæmia of negroes and the rare ovalocytosis. The anæmias which follow hæmorrhage or the lysis of the corpuscles by chemical or bacterial poisons are obvious examples of trauma to the erythron and are repaired according to the ordinary rules of pathology. Just as other organs are damaged by infections and toxæmias, undergoing parenchymatous degeneration or fatty change, so also the erythron with consequent anæmia. Familiar examples are the anæmia of typhoid fever or of chronic nephritis. Not only is the circulating blood impoverished, but the marrow is hypoplastic. In long-standing cachexias the hypoplasia may terminate in a peculiar gelatinous degeneration of the marrow, while a more acute poisoning, such as occasionally follows the injection of salvarsan, leads to complete aplasia of the bone-marrow. The erythron may be the seat of tumour metastasis, or be compressed and almost obliterated by the proliferation of the white cells in leukæmia.

Erythrogenesis and Erythrolysis.

So far we have applied to the erythron the same principles as we should apply to the consideration of the diseases of any other organ, and have discussed the banal effects of trauma, infection, and so on, effects which we are accustomed to describe as secondary or symptomatic anæmia. Most organs, however, have their special diseases, as examples of which I would cite Bright's disease of the kidneys, the cirrhoses of the liver, or the peptic ulcers of the stomach and duodenum. To understand these diseases an intimate knowledge of the structure and function of the organ at fault is necessary. It is not otherwise with the erythron, and if I seem to spend long in discussion of its structure and function, it is because I feel that such knowledge is essential for the understanding of its diseases. If we pause to wonder why the blood contains roughly 100 per cent. of hæmoglobin and 5,000,000 red cells per cubic millimetre, and how it is held constant at this level by the activity of the bone-marrow, we shall soon find ourselves engaged in speculations that seem to lead us far from the immediate problems of medicine. The hæmoglobin content of the blood is dependent on the oxygen tension of the inspired air, and on the need of maintaining a constant internal environment for the organism. The size and number of the red cells are such as to ensure the best utilisation of the hæmoglobin store of the organism, especially in the passage of the blood through the capillaries.[7]

Red marrow is confined to the cancellous bones and the ends of the long bones. The vascular system of the bone-marrow is closed and the whole of the erythron, including the most primitive cells from which it arises, is intravascular. The capillaries of the marrow not only serve to maintain the circulation, but they also have a dual function in erythrolysis and erythrogenesis. The endothelial cells of the sinuses are phagocytic like those of the liver and spleen. Connecting the sinuses are the intersinusoidal capillaries in which the red cells are formed intravascularly, in contrast to the white cells which arise outside the vessels and migrate into the circulation when they mature. The endothelial cells lining the intersinusoidal capillaries give rise to the earliest megaloblasts by mitosis into the lumen. Successive divisions of the megaloblasts produce the erythroblasts, normoblasts, reticulocytes, and thus the red cells of the circulating blood. Developing within the capillary, the red blood-cells dilate the lumen and stretch the wall, but the capillary does not normally open to the circulation until the red cells are mature. This is because the membrane of the young cells is sticky and they adhere to one another. The stickiness persists till about the time when the reticular substance disappears from the cell. The plasma then filters between them, and they are swept into circulation. Just as the capillaries of the muscles and the kidneys vary greatly in activity with the activity of the tissue they supply, so also the capillaries of the marrow. In the marrow they offer not merely a reserve capillary bed, but the potentiality of an enormous hyperplastic response.

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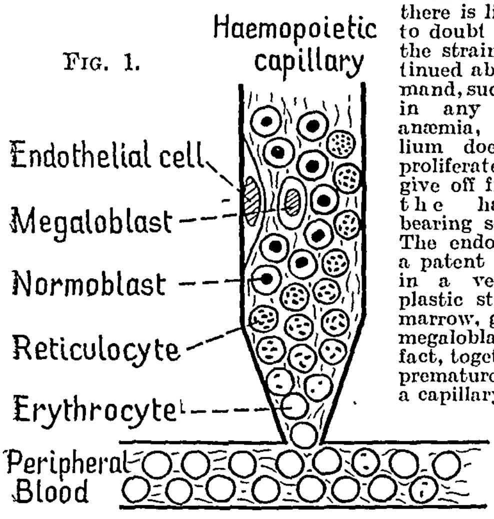
* The first Goulstonian Lecture for 1932 delivered before the Royal College of Physicians of London on March 1st.

> “ In the normal, non-hyperplastic, unstimulated state, the erythroblastic level is the one from which the vast majority of the red cells come. Erythroblasts proliferate rapidly, and in the normal marrow are the youngest type of cell to be seen in all recognisable foci of red blood-cells. One megaloblast is conceivably sufficient to form the basis of an extensive focus of erythroblasts, which may be able to multiply quite indefinitely under normal conditions. Thus the endothelial cells not being called upon to augment the foci of developing red cells which can be maintained by the erythroblasts themselves, or at most only being stimulated to an occasional differentiation of megaloblasts from an isolated endothelial cell, commonly appear in the older, inactive phase. . . . Normal marrow has a considerable store of normoblasts which can then pass through the next phase of their maturation into erythrocytes by the extrusion of their nuclei. But there is little reason to doubt that under the strain of a continued abnormal demand, such as occurs in any secondary anæmia, endothelium does actively proliferate, and does give off free cells of the hæmoglobin-bearing series. . . . The endothelium of a patent sinus may, in a very hyperplastic state of the marrow, give rise to megaloblasts. This fact, together with a premature opening of a capillary, may explain the method by which immature cells get into the circulation.” [5]

FIG. 1.



Schematic diagram of the erythron.

During the maturation process the nucleated erythroblasts elaborate hæmoglobin and they lose their nuclei before becoming adult red cells. Except for a small fraction of reticulocytes, which in health does not exceed 1 per cent., the circulating erythrocytes are all mature cells. The mature red blood corpuscle is as highly specialised and as “ dead ” as the stratum corneum of the skin. The reticulocytes are so called because vital stains render visible in them a network or reticulum, which is really a precipitate of remnants of the basophil cytoplasm of the immature cell. Reticulation is identical with polychromasia, though the vital stains display the basophilia better than eosin-methylene-blue ; punctate basophilia is a modification of the same phenomenon. In the blood stream, or at body temperature in vitro, reticulocytes ripen into adult corpuscles, the process taking from a few hours to a few days, according to the amount of basophil substance they contain. When the delivery of red cells into the circulation is increased, as happens after a considerable hæmorrhage or in the regenerative phase of anæmia, the percentage of reticulocytes rises and may reach 50 per cent. or higher. Conversely, when the delivery of red cells into the circulation is diminished, as happens with artificial plethora in animals or in non-regenerative anæmia in man, the number of reticulocytes falls below the level of health. Enumeration of the reticulocytes is therefore a valuable method for determining the rate of blood formation.

When blood formation is excessively active, the more immature cells, normoblasts and megaloblasts, enter the circulation. Whenever the bone-marrow is hyperplastic nucleated red cells may appear in the peripheral blood ; for it is then easy for them to be washed into the blood stream, especially when hæmopoiesis is not confined to the intersinusoidal capillaries and invades the sinuses. Hyperplasia of the marrow is by no means synonymous with increased blood formation, the reaction is often abortive and the cells fail to mature. This is a very important fact which I shall discuss in full later. I must now emphasise that nucleated red cells are a sign only of hyperplasia of the bone-marrow and are not evidence of increased blood formation unless they are accompanied by an increased number of reticulocytes. The coexistence of nucleated red cells and a reticulocytosis is of course unimpeachable witness of an accelerated delivery of red cells into the circulation, for the reticulocytes will ripen into adult red cells in the blood stream.

Having followed the red cells to their entrance as mature erythrocytes into the circulating blood, we must now inquire into their ultimate fate. Their life has an average duration of 30 days and it is not a whit less hard than that of the superficial cells of the skin. Anyone who has seen cinematograph films of the capillary circulation must have been impressed by the wear and tear to which the red cells are subjected. In Peyton Rous's dramatic words, they are finally threshed to bits. The terminal disintegration of the worn-out red cells can be watched under the microscope with the aid of a warm stage :

> “ A red cell puts out a long process and thereby becomes the so-called poikilocyte. At first the process does not move, then it begins to vibrate slowly, then faster and faster. This vibration marks the beginning of fragmentation. As the process vibrates, it gradually becomes thinner and thinner at some point and then separates. If the thinned-out place is at the base of a long process, the fragment becomes a rod, often looking like an irregular but yellow bacillus ; if near the tip, it becomes a round or oval body. We have seen every variation in size and shape of these processes, up to an actual division of a red cell into two equal parts. . . . We interpret a poikilocyte as the first stage in the process of fragmentation, and the microcyte, in many instances, as a red cell reduced in size after some of its cytoplasm has broken off.” [6]

Exercise, by increasing the wear and tear of the red cells, accelerates their disintegration. In anæmia the cells produced by the bone-marrow are less perfect and more easily worn out. For both reasons rest is an essential measure in the treatment of anæmia. I do not think lysis of the red cells occurs in health, their ultimate fate is always fragmentation. The fragments are taken up by the phagocytes of the reticulo-endothelial system and digested into simpler components. Iron and bilirubin are the most familiar of the disintegration products. It is well established that when large numbers of red cells are suddenly destroyed, the bilirubin in the blood and the excretions is increased and iron is deposited in the liver and other organs. About this there is not a shadow of doubt. On the other hand it is a serious error to argue in the reverse direction and to conclude that hyperbilirubinæmia and hæmosiderosis are always the result of increased blood destruction. Indeed the estimation of the rate of turnover and destruction of red cells is beset with difficulties.

The Dynamics of Blood Formation.

A fundamental question of hæmatology is the decision whether an anæmia is due to diminished blood formation or to increased blood destruction. It is as important to decide this as to decide whether jaundice is obstructive or non-obstructive, or whether anuria is due to suppression or retention. Yet I do not exaggerate when I say that we have no reliable criteria for this purpose. It is desirable that the difficulties should be appreciated, for progress is much retarded when obscure anæmia is attributed without valid evidence to unproved hæmolysis or toxic depression of the functions of the marrow. Hæmatology will not be an exact science until we can measure the number of red cells, which enter or leave the circulation in the 24 hours, with the same accuracy as we can measure the protein metabolism or the work of the heart.

One of the breakdown products of hæmoglobin is the iron-free pigment bilirubin which, after circulating in the blood, is excreted in the bile and converted in the intestine into stercobilin, the form in which it leaves the body. The output of bilirubin can be accurately determined by estimating the stercobilin of the fæces: indirect evidence can be obtained from the bilirubin content of the blood and the urobilin of the urine, though the results are then affected by the functional condition of the liver and kidneys. Physiological experiment shows that there is a fundamental fallacy in trying to gauge the rate of blood destruction from the bilirubin output. When blood is destroyed, the bilirubin obtained from it is not quantitatively excreted. Bilirubin is not a waste product and much of it may be retained to be used over again in the manufacture of fresh red cells. The proportion retained is not a fixed quantity but depends on the needs of the organism.[25] From physiology we must conclude that the turnover of red cells might be increased without any change in bilirubin excretion.

The study of cases of anæmia brings to light even greater difficulties. In pernicious anæmia the excretion of bilirubin derivatives may vary from normal to 20 times the normal in different patients, who show the same profound degree of anæmia and are otherwise indistinguishable. Both Whipple and Jedlicka have calculated the level of the blood exchange in pernicious anæmia on the assumption that the bile-pigment excreted per diem was derived from the breakdown of red cells. Jedlicka calculated that the excretion of bilirubin derivatives may be 13 times as high in a patient with pernicious anæmia as in health, and that in extreme instances such a person must renew the whole of his blood in 21 hours. This is a reductio ad absurdum, for it is impossible for the blood to be renewed in so short a time.

In a subsequent paragraph I shall discuss recent work which proves that hæmolysis plays a secondary part in pernicious anæmia and that the primary cause of the anæmia is a retarded delivery of red cells into the circulation, in fact a much reduced turnover of red cells. It is profitable to compare pernicious anæmia with another metabolic disease, diabetes mellitus. Hyperglycæmia, deposits of glycogen in the heart and kidneys, and excretion of sugar in the urine do not mean that carbohydrate metabolism is accelerated but the very reverse; they are signs of inability to metabolise glucose in the absence of insulin. Similarly in pernicious anæmia hyperbilirubinæmia, deposits of iron in the viscera, and increased excretion of bilirubin derivatives are not because the blood breakdown is accelerated, but because the bone-marrow is unable to use these metabolites in the manufacture of fresh red cells, when the hæmatinic principle, which is elaborated in normal digestion and stored in the liver, is not supplied. Hyperbilirubinæmia and increased excretion of bilirubin derivatives thus come to be associated with a diminished blood exchange. I must leave further discussion of pernicious anæmia till later, but I think there is no doubt that on the one hand the turnover of red cells may be increased without any change in bilirubin excretion, on the other hand that the excretion of bilirubin derivatives gives no reliable information as to the rate of blood exchange.

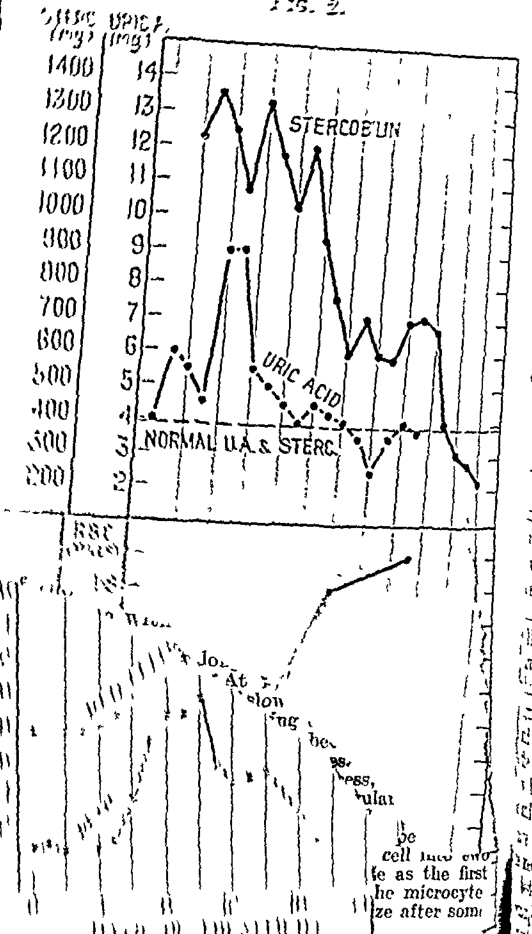
Estimations of the number of reticulocytes have added much to our knowledge of the rate of blood formation in disease, but this test must not be used uncritically, and it needs collateral support. Reticulocytes appear in the blood stream when the marrow is irritated by a variety of substances, such as shellac and colchicin, and marrow irritation must be distinguished from a real increase of red cell production. I have seen reticulocyte counts of 6 per cent. in aplastic anæmia, though the absolute number was small, and this is not surprising when we remember that a few remnants of hyperplastic marrow are usually left in this disease. An increased delivery of red cells into the circulation may be unaccompanied by any rise in the number of reticulocytes, as when a transfusion is given at the beginning of liver treatment in pernicious anæmia.

I have stated these difficulties frankly because they have been so much ignored, but I cannot promise to solve all of them, for the simple reason that there are not enough facts. If we know little about the pigment metabolism in health and disease, we know still less about the other breakdown products of the red cell. The biochemist has devised exquisite chemical analyses of the plasma to ascertain the functions of the kidneys, the liver, and the pancreas, but until recently he has overlooked the chemistry of the erythron itself. The iron content of the viscera is still too often deduced from the microscopical appearances and the ferrocyanide reaction, though these methods were proved fallacious at the beginning of the century. The chemistry of the marrow is unexplored. Happily this has now become one of the active growing points in medical progress. We already known that the loss of the nucleus in the development of erythroblasts into erythrocytes increases the excretion of uric acid[23]; that the reticulocytes contain nuclear phosphorus which disappears when they mature[16]; that there are characteristic changes in the free iron[24] and the lipoids[19] of the serum in the different phases of anæmia. To such researches we look for help in the dynamics of blood formation. In the meantime the physician will do well to remember the wise words of William Hunter with which I have prefaced this lecture. Anæmia must be studied in the patient, and not merely in a droplet of his blood. The erythron does not work in isolation, but in close dependence on the other organs of the body and in subordination to the whole. A blood picture, or indeed a marrow picture, is only a symptom; it may appear as the result of very different causes, and it demands for its explanation the whole history and present state of the patient.

Hæmopoiesis and Anhæmopoiesis.

We see the importance of these points when we study the behaviour of the erythron in disease. Morphologically the changes are simple, consisting on the one hand of hypoplasia or aplasia of the bone-marrow, on the other of hyperplasia. Two degrees of hyperplasia may be described. Usually the number of erythroblasts is much increased, and the red marrow spreads into the shafts of the long bones, [illegible] and normoblasts, with [illegible] which gives [illegible] of uric acid. The [illegible] appears to be the [illegible] in health, [illegible] anæmia the [illegible] of the normal

Fig. 2.



Reticulo [illegible]

[illegible] be [illegible] cell [illegible] te as the first [illegible] he microcyte [illegible] ze after som [illegible]

[illegible] ar of the red [illegible] In anæmia [illegible] less perfect [illegible] easons rest [illegible] of anæmia. [illegible] in health, [illegible] ion. The [illegible] s of the [illegible] simpler [illegible] miliar [illegible] lished [illegible] ry of the disease. Finally, Filo has shown the signs of increased activity of the bone-marrow, reticulocytosis, and the rapid rise of red cells, occur at a time when the stercobilin excretion till considerably raised, and that it never happens t the increased stercobilin excretion disappears re the signs of regeneration of the red cells are n.

do not wish to deny that hæmolysis occurs in nicious anæmia. There is in vitro evidence[3] undue mechanical fragility of the megalocytes, d it is likely that these abnormal cells are not apted for long survival in the circulating blood. ie pathologist regards the phagocytosis of red lls and their debris as a hall-mark of pernicious æmia, and it is rarely if ever absent in the severer ages of the disease. But this hæmolysis is secondary the dysplasia of the bone-marrow, and it is inconivable that there is so much hæmolysis as to account r all the bilirubin put out. The quality and istribution of the hæmosiderosis of pernicious næmia is quite different from that of true hæmolytic næmias such as acholuric jaundice. Some other xplanation than hæmolysis must be found for the yperbilirubinæmia and hæmosiderosis which are so constantly associated with the megaloblastic degeneration of the bone-marrow in pernicious and allied anæmias. As I have already stated, the disturbance of iron and pigment metabolism is probably the result of diminution of the anabolic activity of the bone-marrow. No such accumulation of iron or pigment occurs when erythrogenesis is arrested at the normoblastic level or in aplastic anæmia. It is in some way conditional on the megaloblastic level of dedifferentiation. I feel that the hæmatinic principles, which are necessary for the metabolism of megaloblast into normoblast, must also control the metabolism of iron and pigment, and that therefore the metabolism of iron and pigment is deranged contemporaneously with the megaloblastic degeneration of the bone-marrow, because both are the result of a common cause, and not because one is the effect of the other.

I have devoted considerable time to discussion of the mechanism of pernicious anæmia because it the best-studied of all the anæmias, and because principle of dysplasia of the bone-marrow is of amental importance in the classification of the nias. Tentatively we might divide the anæmias two broad groups: first, those with hypoplastic lastic marrow, and, second, those with hyper- marrow. Then we must subdivide anæmia hyperplastic marrow according as the hyperplasia ive or *hæmopoietic*, and passive or *anhæmopoietic*. anhæmopoietic or maturational anæmias form ay opinion the most important of all the groups iseases of the erythron, and I propose to devote whole of my second lecture to them. Before ncluding this lecture on the physiology and pathogy of the erythron, I should like to say a few words st about splenomegaly in anæmia, and then about he size of the red cells in anæmia.

Splenomegaly.

With the exception of aplastic anæmia, all the chronic diseases of the blood-forming organs tend to produce enlargement of the spleen, whether they involve initially the red cells, white cells, or platelets. On this account the coexistence of anæmia, leucopenia, and splenomegaly never justifies an immediate diagnosis of splenic anæmia, but for lack of further investigation and observation I have several times seen aleukæmic leukæmia, essential thrombopenia, and simple achlorhydric and allied anæmias masquerade under this too comprehensive diagnosis. Splenic anæmia is in reality a rare disease. Enlargement of the spleen and anæmia are more commonly the result of an independent disease of the blood-forming organs than of splenic anæmia. It is now becoming accepted that splenic anæmia is always the result of high pressure in the portal circulation,[18] and that in the great majority of cases this is due to primary disease of the liver, though the morbid change in the liver may be visible under the microscope only.[15] The anæmia is the result of the raised portal pressure, as has often been shown in experimental animals.[21] Identical anæmia occurs in Laennec's cirrhosis of the liver.[17] It is unwise to diagnose splenic anæmia in the absence of signs of raised portal pressure or of liver damage without the most careful circumspection.

The Size of the Red Cells.

If splenic anæmia has often been diagnosed too freely, the reverse mistake has been made about pernicious anæmia, which some hæmatologists have tried to preserve in almost sacred isolation. Pernicious anæmia is not a unique disease, and similar changes occur in the blood in a variety of conditions. The anæmias of sprue and of *Bothriocephalus latus* infestation are closely akin to pernicious anæmia. Our President has described instances of megaloblastic alteration of the bone-marrow in the crises of acholuric jaundice.[4] In both hæmopoietic and anhæmopoietic anæmia the hyperplasia of the marrow may be normoblastic or megaloblastic, and of this fact I shall give many examples in my subsequent two lectures. The appearance of megaloblasts in the marrow and of megalocytes in the peripheral blood is not a specific disease, but a reaction which may occur in a host of different conditions. A disease is "the whole consequence of a conflict between man or animal and the noxious agencies in his environment,"[26] and in the definition of disease entities the clinical and biological features must always be more important than the blood picture.

The reactions of the erythron, which I have described as aplastic, normoblastic, and megaloblastic, can be roughly correlated with variations in the size of the cells of the peripheral blood. The size of the red cells is estimated either by the Price-Jones curve, which is based on the diameter of several hundred red cells, or by the hæmatocrit. The Price-Jones curve has the great advantage of showing the degree of anisocytosis, which is not revealed by the hæmatocrit. The hæmatocrit measures the volume of the cells and may detect changes which are not evident from measurement of the diameter alone. The red cells maintain a very constant size in health, their coefficient of variation being less than one-third of that of the red cells or hæmoglobin. The size of a man's red cells, measured under standard conditions, is as characteristic and permanent as his finger-prints or his electrocardiogram. In disease the mean diameter of the red cells may change and the degree of anisocytosis increase. Price-Jones has recently constructed a curve which embraces all the possible variations in size of healthy red corpuscles. Cells falling outside this ideal curve are pathological. In pernicious anæmia the mean diameter of the red cells is increased and many fall to the right of the ideal curve. They are pathological megalocytes, indicative of abnormal erythropoiesis. On complete and successful treatment with liver, the curve shifts back to the normal position and the pathological megalocytes disappear. In chronic hæmorrhage, and in simple achlorhydric and allied anæmias, the mean diameter of the red cells is diminished and many of the cells fall to the left of the ideal curve. They are pathological microcytes, and their appearance likewise is suggestive of abnormal erythropoiesis. Here the curve returns to the normal position and microcytes disappear on successful treatment with iron.

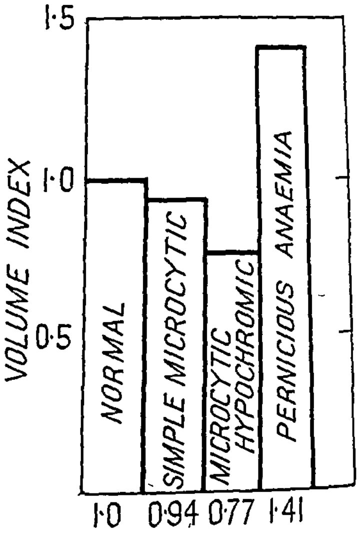
Curves identical with those of pernicious anæmia have been obtained from cases of *B. latus* infection,[11] sprue,[11] chylous diarrhœa,[12] and the hæmolytic anæmia of pregnancy,[20] and it would appear that they can be obtained whenever there is megaloblastic degeneration of the marrow. As regards the microcytic anæmias, it is noteworthy that there is microcytosis both in chronic hæmorrhagic anæmia and in simple achlorhydric anæmia, two conditions in which there is normoblastic hyperplasia of the marrow. The whole story of these variations in size of the red cells is not yet told and the time is hardly ripe for generalising. Price-Jones and his associates have shown that the curves obtained in certain non-Addisonian hæmolytic anæmias resemble that of Addison's anæmia in the increase of the mean diameter of the cells but differ from it in the symmetry of the curve and the absence of anisocytosis.[9] Again, when we consider the appearance of pathological microcytes in the blood, we must remember that some of them may be fragmented normocytes and not preformed microcytes. Finally, the reactions of the erythron are not always pure, and both megaloblastic and normoblastic reaction may occur simultaneously, so that pathological megalocytes and microcytes appear in the same blood. Even more often, a megaloblastic or a normoblastic reaction is accompanied by more or less aplasia of the marrow. With these cautions in mind, we may make the broad generalisations that megaloblastic hyperplasia of the marrow, whatever its cause, is associated with a *megalocytic or macrocytic anæmia.* Normoblastic hyperplasia of the marrow, whatever its cause, is associated with a *microcytic anæmia.* Aplasia and hypoplasia of the marrow, inasmuch as they produce a general depression of the erythron rather than a disturbance of the mechanism of erythropoiesis, cause little change in the size of the red cells and are associated with a *normocytic anæmia.*

This method of classifying the anæmias has been very fully developed by Wintrobe, Haden, and others with the hæmatocrit technique. Wintrobe's cases fell into the following four groups[29] :—

1. The *macrocytic* anæmias, which include cases of pernicious anæmia, sprue, and the pernicious anæmia of pregnancy, and which are characterised by an increase in the mean size and hæmoglobin content of the red corpuscles.
2. The *normocytic* anæmias, which include cases of acute blood loss, malarial infection, and anæmia of the aplastic or semi-aplastic type, and which are characterised by a reduction in the red cell count without any change or at most only a slight increase in the size and hæmoglobin content of the red corpuscles.
3. The *simple microcytic* group includes the most commonly observed forms of anæmia, the anæmia associated with chronic infections such as bronchiectasis and typhoid fever, chronic intoxications such as cardiorenal disease, and carcinomata in which there is no bleeding There is a moderate reduction in the corpuscular volume and hæmoglobin, but at no time is this decrease as great as the reduction in the number of red cells.
4. The *microcytic, hypochromic* group, which includes the anæmia of chronic hæmorrhage, hookworm infestation, and simple achlorhydric and allied anæmias, is distinguished by a marked reduction in the volume of the red corpuscles and a decrease in their hæmoglobin content, which is even more marked than the decrease in size.

Very similar results were obtained by Haden, whose data I have used for Fig. 3. More work must be done before we can properly correlate the size of the red cells with the changes in the marrow. From what we already know of the marrow in infections and toxæmias, it seems likely that in group 3 there is a varying mixture of normoblastic hyperplasia and aplasia, which explains its position between the normocytic anæmia of aplasia and the frank microcytic anæmia of normoblastic hyperplasia. It may be noted in passing that the red cells never become more saturated with hæmoglobin than they are in health, and that a high colour-index is always a sign of megalocytosis. On the other hand, it is quite possible for the corpuscular concentration of hæmoglobin to fall, and a low colour-index may be due to low hæmoglobin concentration or hypochromia, as well as to microcytosis.

FIG. 3.



Volume index of red cells in health and in anæmia.

A given lesion may always produce the same change in the erythron—for instance, hæmorrhage always leads to a normoblastic reaction—but we shall not be surprised to find that the same agency, working under different conditions or with different intensity, may at various times produce any of these reactions For example, sprue may begin with a normoblastic reaction associated with a microcytic anæmia, progress to a macrocytic anæmia with megaloblastic marrow, and terminate in aplastic anæmia. Nor shall we expect the reaction always to be pure in type any more than tumours are sharply divisible into innocent and malignant. The anæmia of gastric achlorhydria sometimes has features of both normoblastic and megaloblastic response and the tropica anæmias show a mixture of megaloblastic reaction and aplasia. All this must persuade that a blood picture is not a disease, and in discussing anæmias in the two subsequent lectures, I shall work as far as possible on a clinical and ætiological basis.

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ELECTROCARDIOGRAPHIC CHANGES DURING TREATMENT OF SEVERE DIABETES.

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THE present investigations concern electrocardiographic changes during the treatment of severe diabetes. The experimental method is outlined, and the results are tabulated and described. Serial electrocardiograms from typical and special cases are reproduced. The metabolism of the diabetic heart is contrasted with that of the normal heart and finally the possible mechanisms underlying the electrocardiographic changes occurring in diabetes are considered.

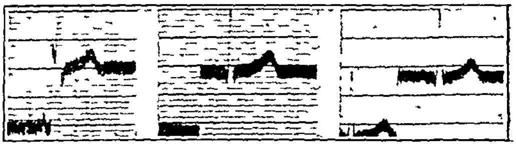
It was thought that the metabolic and arterial disorders occurring in diabetics might either independently or in conjunction be reflected in the electrocardiogram. In the course of treatment by diet or diet and insulin the defects of metabolism are largely abolished. Nor are ischæmic processes consequent upon, for example, early atheroma necessarily ineradicable, for Aschoff has demonstrated that this intimal degeneration is, up to the stage of fatty deposition, a reversible process. It was therefore considered most profitable to study electrically the heart in diabetics undergoing treatment with the aim of revealing modifications in the electrocardiogram.

One or two studies upon lines contiguous to these have already been made. Blitzsten and Schram made an electrocardiographic examination of 70 diabetics of all grades. In only six patients was an attempt made to trace the electrical changes occurring during treatment. Notching of the Q R S complex was found in 30 per cent. of the group, and all the investigations pointed to an increased voltage in severe hyperglycæmia, the amplitude of the deflections falling as the blood-sugar diminished. No mention of the T-waves is to be found in their paper. An electrocardiographic study of 123 diabetics was made by Hepburn and Graham who found that in 56 there were significant electrocardiographic changes, but in only 23 of these patients was more than one record obtained. No attempt was made by these authors to trace successive changes during stabilisation by dietetic or insulin treatment, nor were tracings published by them. Other electrocardiographic investigations such as those of Weichmann and of Middleton and Oatway have been concerned chiefly with hypoglycæmia, while Stepp and Parade have studied the influence of insulin rather than the effect of diabetes itself. Further reference will subsequently be made to these studies.

EXPERIMENTAL METHOD.

The patients selected for observation were those suffering from a severe grade of diabetes. In all the patients at the time of the first electrocardiogram there was considerable hyperglycæmia with glycosuria and variable degrees of ketosis, but actual or threatened coma was never present. In no case was there evidence from the history or the physical examination of cardiac or other additional disease, with the exception of variable degrees of arterial thickening and hypertension which were common among the older patients. Nor were patients showing glycosuria of doubtful origin, such as renal glycosuria, included. The initial tracing was usually taken just after admission to hospital and always before any dietary or other treatment had started. Subsequent records were obtained at intervals ranging from two to seven days, and usually after discharge from hospital further electrocardiograms were taken at intervals of two or three weeks, and later, months.

FIG. 1 (Case 6).



Successive records (lead I.) showing standardisation and increased amplitude of T-wave after one week of treatment.

The experimental group consisted of 20 patients whose ages ranged fairly evenly from 10½ years to 63 years. The duration of the illness in some of them could not be accurately ascertained as investigations were begun at the time of the first diagnosis. In others, presenting themselves with severe uncontrolled diabetes, the disease had started years previously but had never been adequately treated.

Full clinical and biochemical data were obtained in each case. For each patient the state of the urine was recorded both at the time of every electrocardiogram and during the intervals. Every care was taken to procure accurate and comparable electrocardiograms, with the minimal resistance in the patient. The usual standardisation of 1 cm. deflection for one millivolt was actually recorded for each lead in the majority of electrocardiograms (Fig. 1). These serial records were subsequently studied in relation to the changing clinical condition of the patient.

RESULTS.

The patients investigated are listed in the Table in order of age, starting with the youngest. They are arbitrarily separated into two age-groups, those below the age of 40, and those above. It is seen that in the earlier age-group the duration of the disease had been generally one year or less, while in the older patients investigated the disease had been

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present usually for two years or more. The alterations in the component parts of the electrocardiogram are shown in each instance. The first three columns are self-explanatory. Absence of change is throughout indicated by a dash. The notation employed in regard to the T-waves is as follows: a slight increase in amplitude in successive electrocardiograms is indicated by (+), while pronounced increases are shown as (++). The sign (+) is also employed to denote the abolition of a previously inverted or diphasic T-wave, while (++) indicates the appearance of an upright T-wave in the place of one previously inverted or diphasic.

Alterations in the P-wave.—Where any change during treatment was observed it was a diminution. This was found in 6 of the 20 patients

Alteration in P-R interval.—No alteration in the P-R interval was discovered in any case. In some instances it was difficult to compare accurately the P-R interval on account of the somatic tremor present in the earlier electrocardiograms.

Table showing the various changes occurring during treatment in the electrocardiograms of a series of 20 diabetic patients.

Case	Age.	Duration.	Alteration in— (*a*) P-waves.* (*b*) Q R S complexes.	Progressive changes taking place in—		
				T_1	T_2	T_3
1	10½	6/52	(*a*) Diminishing.	+	—	—
2	18	1/12	—	—	—	+
3	19	2/12	—	+	+ +	+ +
4	22	6/12	(*a*) Diminishing.	—	+	+ +
5	23	2/12	,,	+	+	+
6	28	7/12	—	+	+	+
7	32	1 yr.	(*b*) Slurring diminishing.	+	+ +	+
8	33	3/12	,,	—	—	+
9	35	10/12	(*a*) Diminishing.	—	+	+
10	38	6 yrs.	—	+	+	—
11	39	1 yr.	—	+ +	+ +	+ +
12	46	8/12	(*b*) Slurring diminishing.	—	—	+
13	47	2 yrs.	(*b*) Slurring unchanged.	—	—	—
14	55	1½ yrs.	—	+	+	+
15	55	5 yrs.	(*a*) Diminishing.	—	—	—
16	58	6/12	(*a*) Diminishing. (*b*) Slurring unchanged.	+	+	—
17	59	2 yrs.	—	—	—	—
18	60	12 yrs.	—	—	—	—
19	61	4 yrs.	—	—	—	—
20	63	2 yrs.	—	—	—	—

* Alteration in P–R intervals: Nil in each case.

Alteration of Q R S complexes.—Slurring or splintering of the Q R S complexes was observed in five patients, both young and old (Cases 7, 8, 12, 13, and 16). In the first three of these (the younger patients) this deformity of the Q R S complexes either diminished or disappeared.

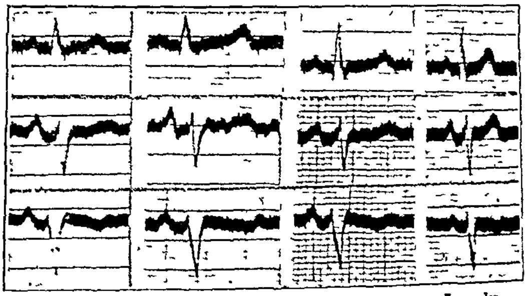
Alterations in the T-wave.—Taking these end-deflections as a whole it was noticeable that modifications occurred more readily in lead III. than in the other leads, and more readily in lead II. than in lead I. Further, it was found that T-wave alterations, whichever lead was considered, were far commoner in the younger age-group than among the older patients, while if any variations in the amplitude of the T-wave were found in the latter group, they were always slight.

The alteration most commonly observed in the T-wave during treatment was an increasing amplitude. This occurred mostly in leads I. and II. (Fig. 2). Another frequent modification was the substitution of an upright T-wave for one previously diphasic or inverted, this change being seen very often in lead III. and occasionally in leads I. and II. (Fig. 3, lead III.).

Changes in T in lead I.—Of the series of 20 patients only two showed initial inversions of T_1 which later became upright (Figs. 3 and 4). In these cases the restoration of a normal T-wave was gradual, occupying about seven weeks in Case 3, and over three months in Case 11. Increasing amplitude of T_1 during treatment was found in seven other patients.

Changes in T in lead II.—In lead II. also, only two patients showed inversion of the T-wave; these were the patients already mentioned in whom T_1 was also inverted. Treatment restored T_2 to a normal sense and shape more readily than in the case of T_1, the change occupying a week or two (Figs. 3 and 4). Increasing amplitude of T_2 during treatment was found in eight other patients.

FIG. 2 (Case 7).



Female diabetic, aged 32. First ECG taken before treatment. Successive records during treatment show, in leads I. and II., increasing amplitude of T-waves, which are finally considerably increased.

Changes in T in lead III.—In 9 of the 11 patients under the age of 40, and in 11 of the whole series, changes took place in T_3 during treatment. This change in seven instances was the substitution of an upright T-wave for one previously diphasic (Fig. 4). In the remaining four patients, increasing amplitude of an upright T-wave or the conversion of a frankly inverted T-wave to the upright form were noted. It was observed that these alterations in T_3 occurred readily, often within a few days of the institution of treatment. The form of T_3 was always apt to vary for no obvious reason (Fig. 4).

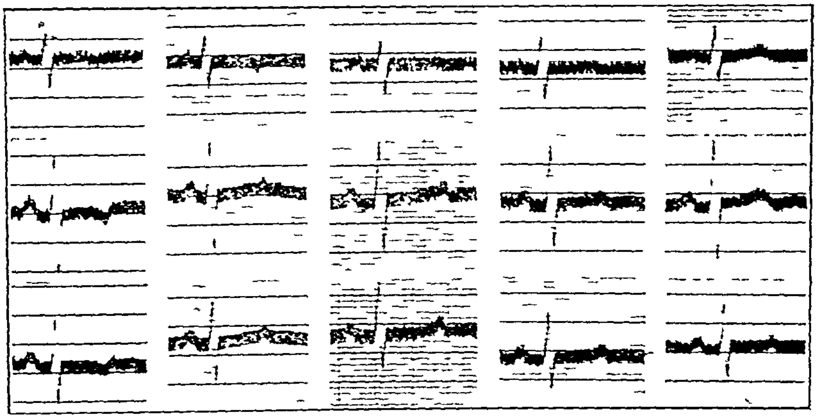
Effect of insulin.—In several patients the changes in the T-waves described above developed progressively, and later, after a few weeks, some diminution of the amplitude of the waves would occur (Figs. 1 and 5). The secondary changes seemed possibly to bear a relation to the use of insulin which is known to cause a reduction in the amplitude of the T-wave. Further reference to this point will be made below.

COMMENTARY.

Among the complications to which diabetics are subject, arterial disease is one of the most formidable. The association of these diseases has been recognised for the past 50 years, but it is not generally appreciated how intimately they are inter-related. Joslin (1928) estimates that arterio-sclerosis in its various forms is responsible for half the deaths in diabetics to-day, while Allen claims that it is demonstrable in every diabetic past middle life in whom glycosuria has been present for ten years or more. Studies of patients over 40 years of age by Bowen and Keonig showed that nearly two-thirds were afflicted with arterial disease. A corresponding proportion of a group of 53 diabetics observed by Heitz gave evidence of early arterial degeneration on oscillometric examination.

But it is not only in the older diabetics that arterial isease supervenes. Shepardson in a radiological nvestigation of 50 patients of at least five years' tanding, and whose average age was 23·4 years, ound arterio-sclerosis in the arge vessels of the lower xtremities in 18. Similar esults were obtained by White nd Hunt who demonstrated y X ray degenerative changes n the arteries of the legs in out of 48 children examined. he average age of the affected hildren was 15 8 years, and in hem the disease had been resent for an average of 6·3 ears.

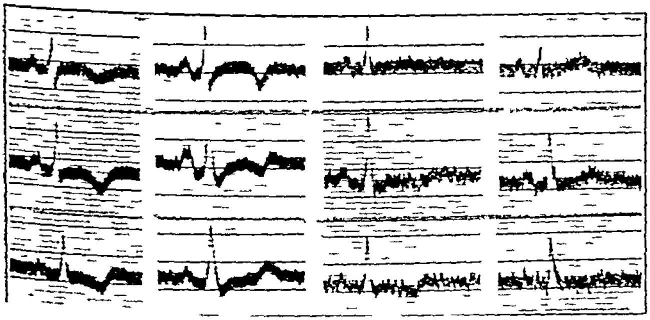
Fig. 3 (Case 3).


2 days. 1 week. 3 weeks. 7 weeks.

Female diabetic, aged 19. First ECG taken before treatment; note inverted T-waves. Successive records show gradual restoration of T-waves to normal form and direction in all leads after seven weeks of treatment.

There is no lack of evidence hat the coronary arteries are ften involved in degenerative processes in the course of liabetes. Indeed, the frequency with which angina pectoris and coronary thrombosis occur in diabetes is a commonplace observation. Levine (1922) found that 7 per cent. of patients with angina pectoris had previously well-defined diabetes, while in his study (1929) of 145 patients suffering from coronary thrombosis, he found glycosuria or a conclusive history of diabetes in no fewer than 23·7 per cent. In these circumstances, and recalling the early age at which advanced arterial changes have been recorded, myocardial damage might well be expected even in young diabetics and in those free from cardiac pain. Joslin (1930), writing of arterio-sclerosis in the youthful diabetic, quotes the case of a girl in her early twenties who, after a week's premonitory symptoms complained suddenly of "pain in the heart" and died within five minutes. He further refers to two male diabetics aged 30 and 33 who died of coronary thrombosis and angina, the diagnosis in both cases being confirmed by autopsy.

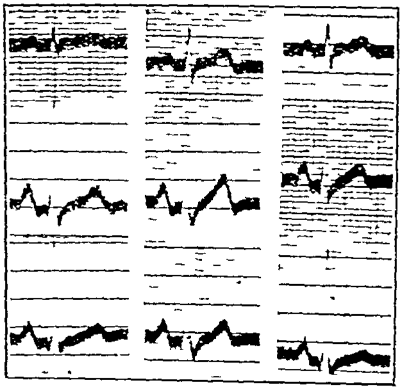
Fig. 4 (Case 11).


4 days. 3 weeks 15 weeks.

Female diabetic, aged 39. First ECG taken before treatment shows concise inversion of T-waves, their form in leads I. and II. suggesting "coronary" T-waves. Later records during treatment show gradual reversion to normal after 15 weeks.

The normal heart muscle stores glycogen, and according to Starling this substance is specially abundant in the conducting tissues. It seems possible that this fact may be connected with the immunity of the diabetics studied in this series from defects of conduction. That the profound disturbances of metabolism occurring in diabetes seriously involve the heart muscle was shown by Cruickshank and Patterson who demonstrated that the diabetic heart only utilises half as much glycogen per gramme per hour as the normal. It might therefore be expected that gross perversions of the normal chemical and electrical cycles taking place with each heart beat might occur even in diabetics having little or no general or coronary arterial disease. That grave disturbances of myocardial function do occasionally result from interference with carbohydrate metabolism has been shown by the studies of Hetényi, of Modern, and of Turner, who have recorded the occurrence of anginal pain as a result of hypoglycæmia in the course of treatment by insulin. Under the term "insulin angina" Parsonnet and Hyman have described the onset of cardiac infarction as an immediate sequel to insulin therapy in seven patients. The fact that in four of these the blood-sugar did not fall below the usually accepted margin of safety shows that hypoglycæmic shock was not the cause of

Fig. 5 (Case 14).


5 weeks. 10 weeks.

Male diabetic, aged 55. First ECG taken before treatment. After five weeks treatment the amplitude of the T-waves is increased in all leads. A lessened amplitude after ten weeks may be related to the action of insulin.

death. Apart from the production of anginal symptoms, there seems no doubt from the experience of these and other workers that heart failure also may be precipitated and accelerated in diabetics with myocardial disease by the use of insulin.

THE CAUSE OF ELECTROCARDIOGRAPHIC CHANGES.

It is seen from the foregoing analysis that the electrocardiographic abnormalities so frequently observed in severe diabetes are by no means constant. They are found in some patients and not in others, although clinically and biochemically both groups may be comparable. Disturbances of the Q R S and T deflections may be pronounced or very slight. Moreover, such alterations may rapidly return to normal during treatment or progressive changes may continue for some weeks or months. For changes so variable in nature, degree, and persistence, no single chemical or structural process is likely to be responsible. Some probable and possible causes are considered below.

Coronary sclerosis.—The clinical evidence for an increased incidence of coronary sclerosis in diabetes has already been discussed. Pathological studies have also gone to prove this association. For example, Blotner in a series of 77 hearts from patients dying of diabetes, found advanced disease of the coronary arteries in 45 per cent., as contrasted with a 21 per cent. incidence among 450 non-diabetic hearts. He also observed that cardiac infarction had been the cause of death in 10 per cent. of these fatal cases of diabetes. Obviously, in many diabetics of long-standing, and especially in those past middle life, there is established thickening of the coronary arteries often with irreversible intimal degeneration, and there can be no doubt that such changes with the consequent ischæmic myocardial fibrosis may account for gross and persisting electrocardiographic abnormalities.

Coronary intimal fatty deposition.—That transient intimal deposition of fat may occur in children and young adults is well known. In a discussion of this occurrence, Aschoff remarks that the "process depends purely upon the deposition of cholesterol esters." He quotes Mönckeberg, who in autopsies on 79 healthy soldiers under the age of 30 years, found aortic intimal fatty change in 57. It is held that while this intimal change of the "ascending period" of the vascular system may retrogress, the involution of a senescent atheromatous patch is absolutely excluded. In support of the view that an excessive concentration of lipoids, particularly cholesterol esters, is responsible for this intimal fatty deposition, is the well-known experimental work of Anitschkow and Chalatow on rabbits.

Studies of the cholesterol content of the blood show that this substance is frequently present in excess in diabetics. This has been shown by White and Hunt in a study of diabetic children, and by Gray in a large series of adult diabetics. Nor is the excess of cholesterol confined to the blood alone, for it has been shown to be present in unusual amount in the aorta and peripheral arteries in diabetics. Labbé, Nepveux, and Heitz found the increase to be 60 per cent. in the aorta and approximately six-fold in the tibial arteries. Since the lipoid concentration of the blood tends to be greater in severe diabetes the liability in the latter condition to fatty intimal deposition should be greater. The influence of hypercholesterolæmia in producing arterial damage remains questionable in view of the fact that the pronounced cholesterolæmias of jaundice and nephrosis are unaccompanied by arterial change. However, such cases are not strictly comparable with high-grade diabetics who have in addition a severe ketosis.

While electrocardiographic abnormalities that change within a day or two of the disappearance of hyperglycæmia and acetonuria might scarcely be ascribed to the retrogression of a fatty intimal change in a coronary artery, it is possible that this process accounts for the slow disappearance of gross abnormalities (Figs. 3 and 4) and for the gradual abolition of slurring in the Q R S complexes.

Abnormal metabolic products.—It is tempting to believe that the flattening or inversion of the T-waves in diabetes is due to the circulation of some toxic body or abnormal metabolic product in the blood. This possibility was discussed by Hepburn and Graham, who remarked that such electrocardiographic changes were not found in the few cases of "severe acidosis" studied by them, while many diabetics with considerable hyperglycæmia had normal electrocardiograms. They further concluded that hyperglycæmia and the products of perverted metabolism are not the cause of the abnormal electrocardiogram. Evidence on this matter has, from a different angle, been brought by Taterka, who has traced the electrocardiographic changes occurring in diabetic coma. His records were taken immediatel after the institution of insulin and other treatment He found a general lowering of all excursions particularly of the T-wave, which was frequentl diphasic or completely negative. These change disappeared after recovery, even though high insuli administration was being continued. This fac and the usual latency in the appearance of th electrocardiographic changes produced by insuli therapy apart from coma led Taterka to believ that the abnormal electrocardiograms could n have been due to the administration of insuli but that a toxic myocardial damage due to acidos must have been the cause. He states that comparab changes may be found in some infective diseases.

It has been shown by Dodds and Robertson th the theories of ketosis and acidosis are inadequa to explain the occurrence of coma in diabetes, sin many non-comatose patients were found to have higher aceto-acetic acid content than those in con A persistently falling blood pressure was found precede death in coma. The present investigations into myocardial function in severe diabetes and those of Taterka relating to coma lend support to the view that circulatory failure is at least a contributory cause of death in many comatose diabetics.

Defective nutrition of the myocardium.—An acute deficiency in the blood-supply to the myocardium very commonly gives rise to anginal pain. This pain is generally held to be a consequence of myocardial anoxæmia, but there is evidence that it may alternatively result from reduction in the supply of sugar to the heart, as witness the records already referred to above (Hetényi; Modern; Parsonnet and Hyman; Turner) of angina pectoris precipitated by the use of insulin whether in normal or excessive amounts. Since deprivation of oxygen or of sugar may precipitate identical symptoms, there seems, by analogy, no reason to believe that they may not cause similar electrocardiographic changes. Acute anoxæmia has been shown by Ward and Wright to cause reduction, abolition, or inversion of the T-wave in lead II., while comparable changes have been recorded by Greene and Gilbert in chronic anoxæmia. It seems, therefore, not unreasonable to infer that the changes in the T-wave may be due to the reduction in the gar-utilisation of the heart, that has been shown occur in diabetes (Cruickshank and Patterson).

Such a mechanism might account for changes which e only completely rectified after some weeks of abilisation (Figs. 3, 4, 5), as well as for those which sappear more rapidly (Fig. 2). The form of the -wave deviations in Cases 3 (Fig. 3) and 11 (Fig. 4) e of significance in this connexion. In both of these atients the T-wave was strikingly affected, and in ach case there was either flattening or inversion t all leads. Such an effect does not suggest a ronary origin, for, as Parkinson and Bedford have own. where depression of the R-T interval or -wave in lead I. is the sequel to coronary obstruction, e change, if any, in lead III. must be in the direction f elevation. The T-wave deformities in the diabetic ggest rather an intimate parenchymatous change. he rectification of such changes of long standing ight well take some weeks of dietetic and insulin reatment. A parallel may be observed in the yxœdematous patient who commonly shows inversion of the T-wave in all leads. These electrocardiographic anomalies, like those of the diabetic, lo not suggest a coronary basis, nor is arterio-scelerosis he rule in myxœdema. Treatment by thyroid medication will, after some weeks or months, reproduce a normal electrocardiogram in myxœdema, just as appropriate treatment in the diabetic soon restores the normal nutrition and activity of the myocardium, thereby restoring the normal electrocardiogram.

It is profitable also in this connexion to compare the metabolic and electrocardiographic changes observed in hyperglycæmia with those of hypoglycæmia. These two conditions are the extremes of the blood-sugar scale ; in most metabolic spheres they offer a sharp contrast, and yet the effect of both is a deficiency in the utilisation of carbohydrate. When there is sudden hypoglycæmia after previous prolonged treatment with insulin the tissues are not supplied with sufficient sugar for their needs, while in hyperglycæmia a glut of sugar is generally accompanied by an inability of the tissues to utilise it. Deficient utilisation of sugar is thus a feature of both conditions. It might therefore be expected that hypoglycæmia and hyperglycæmia would be attended by the same, if any, alterations in the curves of the electrocardiogram. This is seen to be the case. The studies of Stepp and Parade. Weichmann, and of Middleton and Oatway, to which reference has already been made, have demonstrated the depression of the T-waves in hypoglycæmia. The present observations recorded above show that in severe untreated diabetes there is also a flattening of the T-waves which become larger as treatment progresses. The effect of insulin in flattening the T-waves in the electrocardiogram has been already referred to in connexion with the present study. Several patients showed an initial increase in the amplitude of the T-waves, which was followed after some weeks of insulin therapy by a reversion to the lesser amplitude (Fig. 5).

SUMMARY.

1. Successive electrocardiograms were taken during treatment in 20 diabetics of all ages. These were at first at intervals of a few days, and later of weeks and months.

2. The tabulated results showed that the most pronounced changes occurred in patients below the age of 40, the T-waves being commonly flattened in leads I. and II., and often diphasic in lead III. Increasing amplitude of the T-waves in leads I. and II., and the substitution of an upright for a diphasic T-wave in lead III. were the effects most frequently observed during treatment. In two patients inversion of the T-wave in all leads was recorded at the outset. All of these changes disappeared progressively during treatment. whether by diet alone or by diet and insulin. The most uniform change and restoration was observed in lead II., while the T-wave in lead III. was more easily influenced by treatment and less stable in its form and direction.

3. Other occasional electrocardiographic changes occurring during treatment were progressive diminution of the P-wave and progressive lessening of slurring in the Q R S complexes.

4. The causal factors underlying the changes described were considered under the following structural and metabolic heads: (*a*) coronary sclerosis ; (*b*) coronary intimal fatty deposition ; (*c*) abnormal metabolic products ; (*d*) defective nutrition of the myocardium.

5. It was concluded that the electrocardiographic changes produced by diabetes represent mainly a parenchymatous damage to the heart resulting from defective nutrition. Coronary disease, whether sclerotic and permanent or of an early reversible fatty type, probably plays a subsidiary rôle in the production *of abnormal electrocardiograms.*

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WOLVERHAMPTON CONTRIBUTORY SCHEME.—The contributory scheme of Wolverhampton Royal Hospital, which came into operation in October last, is already an assured success. It has been joined by 790 firms within its orbit, and in addition to the work of many district committees, 1400 persons are paying their contributions direct. The 3000 miners employed by the West Cannock collieries have decided to join.

JERUSALEM OPHTHALMIC HOSPITAL.—The ophthalmic hospital in Jerusalem, maintained by the British Realm of the Order of St. John, is being connected by a subway with the recently opened annexe. The annexe is lower down the main road between Jerusalem and Bethlehem than the main building, and traffic has increased so greatly that patients can no longer pass in safety from the one to the other. The work is now approaching completion.

STAPHYLOCOCCAL TOXIN.

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The hæmolytic and leucocidal actions of staphylococcal toxin have been recognised for many years. Denys and Van de Velde[1] writing in 1895 described the destructive effect upon the leucocytes in the pleural cavities of rabbits following the injection of staphylococci, as well as the appearance of anti-leucocidin in the serum of immunised rabbits. The hæmolytic action of the cocci on blood-plates was noted by Kraus[2] in 1900, and in 1922 an important paper on the subject was published by Julianelle,[3] who demonstrated that the hæmolytic titre did not correspond either to pathogenicity or to leucocidin production. More recently Burnet[4] has added to our knowledge of the toxins and in particular to their mode of production in vitro. Parker Weld and Gunther[5] have described methods of separating the different components of the toxin.

The present paper deals with an investigation, both quantitative and qualitative, of the toxins obtained from 22 strains of staphylococci derived from a variety of human lesions. Our object has been to examine the relative importance of the different toxin constituents in human pathology.

The toxic properties examined were the following: hæmolytic, leucocidal, necrosing, and lethal.

TECHNIQUE AND RESULTS.

1. *Toxin preparation.*—This was obtained by Burnet's method and as previously described by us.[6] After final sterilisation through a Seitz filter the pH was brought to 7·0–7·2, a few drops of chloroform were added, and the surface of the filtrate covered with a layer of sterile liquid paraffin.

2. *Hæmolysin tests.*—Three tubes were put up for each filtrate, giving final dilutions of 1 : 50, 1 : 200, and 1 : 800. Washed rabbit cells were used in final 1 per cent. dilution. After mixing, the tubes were left in the incubator for one hour, reshaken, left on ice over night and read next morning.

3. *Necrosis of rabbit's skin.*—Intradermal doses of 0·2 c.cm. were given. Strongly hæmolytic filtrates used in 1 : 20 dilution commonly gave an area of necrosis 1·5 to 2 cm. in diameter, and this was taken to indicate a strong necrotoxin. Feebly hæmolytic filtrates were used in 1 : 5 and 1 : 20 dilutions, the former being usually feebly positive and the latter negative, indicating a weak necrotoxin. When the 1 : 5 dilution was negative a subsequent test was made with undiluted toxin. Fresh rabbits were always taken and up to six filtrates were tested simultaneously on the same animal. We believe that the results indicate adequately whether a weak or strong necrotoxin was present.

4. *Lethal action.*—This was investigated with four toxins only, Nos. 2, 3, 4, and 6. Young rabbits each weighing 1 kg. were used and a preliminary injection of 0·5 c.cm. was made into a vein. If death did not occur within a short period, further injections were made.

5. *Leucocidin.*—Human blood-cells obtained by venepuncture were washed in saline, a narrow centrifuge tube being used for the final washing in order to concentrate the leucocytes. The toxin, adjusted if necessary to pH 7–7·2, was diluted with saline to 1 : 2 and 1 : 8. Equal volumes of cells and filtrate were incubated for one hour in a Wright's pipette. The contents, after a thorough washing in and out of the pipette, were mixed in the proportions of 2 volumes of the toxin cell mixture with 1 volume of fresh human serum and 1 volume of a staphylococcal suspension. After 20 minutes' incubation the contents were again washed out, the drop thoroughly stirred with a platinum loop, and a film made from a loopful of the mixture and stained with Leishman. The addition of the phagocytic mixture was continued because it provided an additional functional test for the phagocytes and because it was found that this extra dilution of the cells led to more satisfactory films. The use of the platinum loop was adopted because the neutrophils tended to form small clumps, and it was felt that the loop would demonstrate the presence of these clumps more certainly than the usual method of drawing out a blood-film. With some filtrate mixtures after incubation, small masses tending to block the pipette were observed. These clots were caught whenever possible and rubbed out into films for examination.

In the control films many phagocytes were present, often in clumps. With a strong leucocidin (marked A in the Table) all the phagocytes were destroyed in both the dilutions 1 : 4 and 1 : 16 which were employed for the routine test. Well-stained lymphocytes were present. Such toxins usually produced clots, films of which showed masses of almost homogeneous basophil cell debris entangling normal lymphocytes. If this phenomenon occurs in vivo, it supplies a possible explanation of the septic emboli so commonly associated with staphylococcal septicæmia. Filtrates marked C in the Table appear to have no destructive action on the leucocytes in either dilution. B indicates a weak leucocidin with partial or almost complete destruction at 1 : 4 and very little action at 1 : 16. B filtrates sometimes produced clots which were found to contain many intact polymorphonuclears. The red cells, except in the case of one toxin, No. 7, were unaffected.

The Table indicates the amount of each type of toxin in the various filtrates: A represents a strong toxin; B a feeble one; and C almost complete absence of the toxin. In the fourth column an attempt is made to indicate in a similar manne the severity of the human lesion from which th strain of cocci was obtained: A represents a sever lesion such as osteomyelitis or large carbuncle, an A+ a case in which there was evidence of pyæmia B indicates a small local lesion such as a boil or stye and C a purely superficial infection such as sycosi barbæ.

Strain.	Hæmolysin.	Necrotoxin.	Leucocidin.	—	Human lesion.			—
					Sex.	Age.	D.*	
1	A	A	A	B	M.	32	–	Boil on buttock.
2	A	A	B	C	M.	30	–	Sycosis barbæ.
3	B	B	A	A	F.	46	+	Severe carbuncle of neck.
4	B	B	A	A+	F.	13	–	Fatal infection of lip.
5	C	C	C	A	M.	4	–	Osteomyelitis of tibia.
6	A	A	C	C	M.	2	–	Skin eruption on face.
7	A	A	C	B	M.	52		Prostatitis.
8	A	A	A	B	M.	49	–	Small carbuncle of wrist.
9	B	B	A	A	M.	21	–	Severe carbuncle of neck.
10D 10P	A C	A C	B C	C C	M.	35	–	Sycosis barbæ of 15 years' history.
11	B	B	A	A+	M.	17	–	Three years' pyæmi following bone infection.
12	A	A	B	A	F.	55	+	Carbuncle: septicæmia two years before
13	B	B	B	B	F.	19	–	Severe infected han
14	B	B	A	A+	F.	15	–	Osteomyelitis o humerus an empyema.
15	A	A	C	A	M.	5	–	Acute osteomyeliti with rapid improvement.
16	A	A	A	B	M.	19	+	Nasal furuncl following many sma infections.
17	B	A	A	B	F.	16	+	Stye following ca buncle in Case 3.
18	A	A	C	C	F.	28	–	Sycotic condition o leg.
19	B	B	B	A	M.	13	–	Empyema followin wound of thorax.
20	A	A	B	A	M.	65	+	Severe carbuncle.
21	A	A	B	A	M.	$\frac{14}{365}$	–	Fatal abscess of bac possibly after injur
22	B	A	A	A+	F.	21	–	Fatal infection of li

D* = diabetes.

Analysis of the Table shows that the hæmolysin d necrotoxin vary together on the whole, but that ght discrepancies may occur, as with Nos. 17 and 22. th of these gave weak hæmolysin, but the necrotoxin d to be labelled A, though the reactions were finitely feebler than the majority in this class. ese slight differences tend to support Parker Weld d Gunther in their contention that the hæmolysin d necrotoxin are distinct.

FOUR GROUPS OF STRAINS.

Comparison of the hæmolysin and leucocidin rmits a division of the strains investigated into ur groups:—

1. Those with high leucocidin and low hæmolysin.
2. Those with high leucocidin and high hæmolysin.
3. Those with low leucocidin and high hæmolysin.
4. Those with low leucocidin and low hæmolysin.

is advantageous to compare these groups with the pes of human lesions from which the strains were rived.

Group 1 consists of seven strains (Nos. 3, 4, 9, 11, 4, 17, 22) with strong leucocidin and weak hæmolysin. ll these strains were obtained from severe lesions, e only exception being No. 17, which was grown from small stye, following a carbuncle from which No. 3 as obtained, and it is to be presumed that the two rains were identical. All the four strains from æmic cases fall in this group and include two rains from rapidly fatal cases of carbuncle of the p. The association therefore of this class of toxin ith virulent disease in man is remarkably constant.

Group 2 comprises three strains (Nos. 1, 8, 16) ch both in leucocidin and hæmolysin. Two were erived from a common, small single boil, and one om a small carbuncle, of short duration, which ielded rapidly to treatment. The few strains of his group in our Table may be due to the fact that hese were the only cultures examined from this ommon and perhaps most typical staphylococcal esion in man.

Group 3.—Strains with weak leucocidin and strong æmolysin (Nos. 2, 6, 7, 10D, 12, 15, 18, 20, 21). These strains were obtained from lesions of very ifferent severity but some classification is possible. The most definite finding is that all the sycosis cases all within this group—namely, 2, 6, 10D, 18. No. 7 may well be a secondary infection; No. 15 came from a case of acute osteomyelitis which cleared up rapidly after operation and without complication. No. 21 was obtained from a baby of 14 days with a strong suspicion of injury and presumably poor resistance. Nos. 12 and 20 both came from carbuncles in elderly diabetics.

Group 4.—Strains weak both in leucocidin and hæmolysin (Nos. 5, 10P, 15, 19) have some clinical evidence of a saprophytic origin; 10P grew in pale colonies and was isolated from strain 10D which yielded a strong hæmolysin. Nos. 15 and 19 both came from infected wounds, one of the hand, the other of the thorax. No. 5 strain is unique in our experience in that it produces no hæmolysin at all and no detectable leucocidin. It was derived from an osteomyelitis lesion in a child of 3 years. It is difficult to account for the appearance of this strain and its inclusion in this group. A streptococcus was subsequently isolated from the pus of the case, but the staphylococcus was obtained twice from earlier specimens in apparently pure culture.

The lethal action for rabbits was tested in the case of four toxins only. Nos. 6 and 2 were chosen as being strongly hæmolytic and feebly leucocidal, Nos. 4 and 3 as being of the reverse order; 0·5 c.cm. of the hæmolytic toxin No. 6 was given to two rabbits, the first died in three minutes, the second showed symptoms, but recovered and was given a further 1 c.cm. two hours later. Death was almost instantaneous. The other hæmolytic toxin No. 2 killed a rabbit in two minutes. Leucocidal toxin No. 4 was given to two rabbits in doses of 0·5 c.cm., followed two hours later by 1 c.cm. and 30 minutes later by a second 1 c.cm., without effect. Similarly toxin No. 3 showed no lethal action.

It appears therefore that the lethal action of a toxin for rabbits runs parallel with the necrosing effect on the rabbit's skin and the hæmolytic titre for rabbit red cells, but is distinct from the leucocidal action on human white cells.

Cultural characters.—The separation of 22 strains of staphylococci into four groups on the basis of toxin production suggested the possibility that cultural differences might be detected for the groups. The full cultural characters of 16 strains were investigated. In the fermentation reactions of the 13 carbohydrates selected all showed complete uniformity. A few strains acidified but failed to clot milk, and three strains (Nos. 7, 8, and 18) failed to liquefy gelatin. There was thus no association between cultural characters and toxin production. The peculiar strain No. 5 which yielded no toxin gave typical cultural reactions throughout.

DISCUSSION.

Antitoxin production.—In a recent paper with Mr. V. W. Dix the use of an antitoxic serum prepared for us by Dr. G. F. Petrie was described. This serum was derived from a horse inoculated with a single strain toxin of high hæmolytic titre. It was shown to have the power of neutralising both the hæmolytic and necrosing properties of the toxin. The toxin was that derived from strain No. 1 in the Table, and was subsequently found to have a high leucocidal titre also. Titration of the concentrated antiserum against normal horse serum showed an antileucotoxic power of 20 to 1. The selection of this toxin for immunisation was thus, in part, a matter of chance. It is, at least, suggested that the most important toxic fraction in severe human lesions is the leucocidal, and it is possible that a more potent serum might be obtained from the use of a Group 1 rather than a Group 2 toxin.

In our description of the toxic action upon the leucocytes we have suggested that the tough macroscopic clots found in vitro may be a source of pyæmic emboli in vivo. Dr. Petrie's antitoxic serum seemed most efficacious in the pyæmic cases and we noted at the time the complete cessation of metastatic abscess in all the cases so treated.

Constancy of toxin production.—The 22 staphylococcal strains have been divided into groups on the basis of the proportional production of hæmolysin, with which are associated necrotoxin and lethal toxin, and of leucocidin. Only four main divisions are possible and all are represented in our strains. It can be said therefore that the staphylococcus may put out much or little hæmolysin or leucotoxin or both, and any classification on these lines would be without meaning unless these outputs are *constant* for the strain. We believe that toxin production by the strain is constant within such limits as we have been able to examine them. The majority of these strains have been isolated for some months, from many of them fresh toxins have been periodically prepared on different occasions and no serious alteration in the

STAPHYLOCOCCAL TOXIN.

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The hæmolytic and leucocidal actions of staphylococcal toxin have been recognised for many years. Denys and Van de Velde[1] writing in 1895 described the destructive effect upon the leucocytes in the pleural cavities of rabbits following the injection of *staphylococci*, as well as the appearance of antileucocidin in the serum of immunised rabbits. The hæmolytic action of the cocci on blood-plates was noted by Kraus[2] in 1900, and in 1922 an important paper on the subject was published by Julianelle,[3] who demonstrated that the hæmolytic titre did not correspond either to pathogenicity or to leucocidin production. More recently Burnet[4] has added to our knowledge of the toxins and in particular to their mode of production in vitro. Parker Weld and Gunther[5] have described methods of separating the different components of the toxin.

The present paper deals with an investigation, both quantitative and qualitative, of the toxins obtained from 22 strains of staphylococci derived from a variety of human lesions. Our object has been to examine the relative importance of the different toxin constituents in human pathology.

The toxic properties examined were the following: hæmolytic, leucocidal, necrosing, and lethal.

TECHNIQUE AND RESULTS.

1. *Toxin preparation.*—This was obtained by Burnet's method and as previously described by us.[6] After final sterilisation through a Seitz filter the pH was brought to 7·0–7·2, a few drops of chloroform were added, and the surface of the filtrate covered with a layer of sterile liquid paraffin.

2. *Hæmolysin tests.*—Three tubes were put up for each filtrate, giving final dilutions of 1 : 50, 1 : 200, and 1 : 800. Washed rabbit cells were used in final 1 per cent. dilution. After mixing, the tubes were left in the incubator for one hour, reshaken, left on ice over night and read next morning.

3. *Necrosis of rabbit's skin.*—Intradermal doses of 0·2 c.cm. were given. Strongly hæmolytic filtrates used in 1 : 20 dilution commonly gave an area of necrosis 1·5 to 2 cm. in diameter, and this was taken to indicate a strong necrotoxin. Feebly hæmolytic filtrates were used in 1 : 5 and 1 : 20 dilutions, the former being usually feebly positive and the latter negative, indicating a weak necrotoxin. When the 1 : 5 dilution was negative a subsequent test was made with undiluted toxin. Fresh rabbits were always taken and up to six filtrates were tested simultaneously on the same animal. We believe that the results indicate adequately whether a weak or strong necrotoxin was present.

4. *Lethal action.*—This was investigated with four toxins only, Nos. 2, 3, 4, and 6. Young rabbits each weighing 1 kg. were used and a preliminary injection of 0·5 c.cm. was made into a vein. If death did not occur within a short period, further injections were made.

5. *Leucocidin.*—Human blood-cells obtained by venepuncture were washed in saline, a narrow centrifuge tube being used for the final washing in order to concentrate the leucocytes. The toxin, adjusted if necessary to pH 7–7·2. was diluted with saline to 1 : 2 and 1 : 8. Equal volumes of cells and filtrate were incubated for one hour in a Wright's pipette. The contents, after a thorough washing in and out of the pipette, were mixed in the proportions of 2 volumes of the toxin cell mixture with 1 volume of fresh human serum and 1 volume of a staphylococcal suspension. After 20 minutes' incubation the contents were again washed out, the drop thoroughly stirred with a platinum loop, and a film made from a loopful of the mixture and stained with Leishman. The addition of the phagocytic mixture was continued because it provided an additional functional test for the phagocytes and because it was found that this extra dilution of the cells led to more satisfactory films. The use of the platinum loop was adopted because the neutrophils tended to form small clumps, and it was felt that the loop would demonstrate the presence of these clumps more certainly than the usual method of drawing out a blood-film. With some filtrate mixtures after incubation, small masses tending to block the pipette were observed. These clots were caught whenever possible and rubbed out into films for examination.

In the control films many phagocytes were present, often in clumps. With a strong leucocidin (marked A in the Table) all the phagocytes were destroyed in both the dilution 1 : 4 and 1 : 16 which were employed for the routine test Well-stained lymphocytes were present. Such toxin usually produced clots, films of which showed masses almost homogeneous basophil cell debris entangling norm lymphocytes. If this phenomenon occurs in vivo, i supplies a possible explanation of the septic emboli s commonly associated with staphylococcal septicæmi Filtrates marked C in the Table appear to have r destructive action on the leucocytes in either dilution. *B indicates a weak leucocidin* with partial or almost complete destruction at 1 : 4 and very little action at 1 : 16. B filtrates sometimes produced clots which were found to contain many intact polymorphonuclears. The red cells, except in the case of one toxin, No. 7, were unaffected.

The Table indicates the amount of each type of toxin in the various filtrates: A represents a strong toxin; B a feeble one; and C almost complete absence of the toxin. In the fourth column an attempt is made to indicate in a similar manner the severity of the human lesion from which the strain of cocci was obtained: A represents a severe lesion such as osteomyelitis or large carbuncle, and A+ a case in which there was evidence of pyæmia; B indicates a small local lesion such as a boil or stye; and C a purely superficial infection such as sycosis barbæ.

Strain.	Hæmolysin.	Necrotoxin.	Leucocidin.	—	Human lesion.			—
					Sex.	Age.	D.*	
1	A	A	A	B	M.	32	–	Boil on buttock.
2	A	A	B	C	M.	30	–	Sycosis barbæ.
3	B	B	A	A	F.	46	+	Severe carbuncle of neck.
4	B	B	A	A+	F.	13	–	Fatal infection of lip
5	C	C	C	A	M.	4	–	Osteomyelitis of tibia
6	A	A	C	C	M.	2	–	Skin eruption on face
7	A	A	C	B	M.	52		Prostatitis.
8	A	A	A	B	M.	19	–	Small carbuncle of wrist.
9	B	B	A	A	M.	21	–	Severe carbuncle of neck.
10D	A	A	B	C	M.	35	–	Sycosis barbæ of 15 years' history.
10P	C	C	C	C				
11	B	B	A	A+	M.	17	–	Three years' pyæmia following bone infection.
12	A	A	B	A	F.	55	+	Carbuncle: septicæmia two years before.
13	B	B	B	B	F.	19	–	Severe infected hand.
14	B	B	A	A+	F.	15	–	Osteomyelitis of humerus and empyema.
15	A	A	C	A	M.	5	–	Acute osteomyelitis with rapid improvement.
16	A	A	A	B	M.	19	+	Nasal furuncle following many small infections.
17	B	A	A	B	F.	46	+	Stye following carbuncle in Case 3.
18	A	A	C	C	F.	28	–	Sycotic condition on leg.
19	B	B	B	A	M.	13	–	Empyema following wound of thorax.
20	A	A	B	A	M.	65	+	Severe carbuncle.
21	A	A	B	A	M.	$\frac{14}{365}$	–	Fatal abscess of back, possibly after injury.
22	B	A	A	A+	F.	21	–	Fatal infection of lip.

D* = diabetes.

EMORRHAGIC PURPURA FOLLOWING SCARLET FEVER.

REPORT OF TWO CASES IN ONE FAMILY.

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A SMALL outbreak of scarlet fever began in Oxford out Feb. 8th, 1931, seven cases being reported, ur of which came under the observation of one of (F. G. H.). All the cases were mild, and the only mmon factor was that all received their milk from e same dairy. A careful investigation by the iblic health authorities threw no light on the source infection. Of the seven cases, four had been ceiving Grade A milk supplied by the dairy, while ree had received the ordinary milk, the two supplies ing kept quite distinct. With the exception of e two cases which form the subject of this report, l made an entirely uneventful recovery and nvalescence.

CLINICAL NOTES (F. G. H.).

The cases with which this account is concerned pear to us to be unique, so that it is wise to mention l details which may be relevant.

Family history.—The parents of the children ncerned are distant cousins. On neither side is ere any history of "bleeding" or other morbid heritance, and longevity is the normal expectation f the members of both families.

Past history.—The three children in this family, girl aged 7, a boy aged 5, and a girl aged 3, were ll healthy children who had hitherto experienced nly minor ailments and escaped any of the specific evers. All three were inclined to have large tonsils nd adenoids. They had unusually liberal allowances f fresh food in the form of fruit, salads, milk, eggs, nd wholemeal bread, and spent much time in the pen air. All were dark-haired and well nourished, ith dark eyes and high-coloured rosy cheeks.

History of the cases.—On Feb. 8th the boy, aged 5, ontracted scarlet fever, the onset being marked by ever and a sore-throat. All three children had been laying together on the 8th, and the exposure of the wo sisters was obvious. The patient and his elder ister had three years previously been given prophylactic diphtheria antitoxin; therefore no anticarlatinal serum was administered in either case for fear of a serum reaction. The younger sister was given a prophylactic dose of anti-scarlatinal serum, and protected. On Feb. 12th the elder sister, aged 7, developed scarlet fever. The two children were then nursed in the same room, the beds being at least eight feet apart. In each case the scarlet fever was of a mild order, the temperature lasting only three days, and in neither case reaching 103° F. at its highest. The initial fever subsided, but both children simultaneously developed an acute bronchitis, introduced by an attendant, and were febrile for a further period of three or four days. There was at the same time some enlargement of the glands under the jaw from the infected tonsils.

On Feb. 23rd, 16 days from the onset of the scarlet fever, the first patient developed hæmorrhagic purpura and was dead in 48 hours, the temperature having been normal for the previous five days and the child's general condition excellent. On March 5th, 21 days from the onset of the scarlet fever, the second patient developed hæmorrhagic purpura and was dead in three days, the temperature having been normal for the previous seven days and the child's general condition excellent.

CLINICAL AND PATHOLOGICAL NOTES.

CASE 1.—The boy, when first seen on Feb. 23rd, 16 days from the onset, was desperately ill, waxy yellow in colour, with a barely detectable pulse at the wrist, and having vomited normal stomach contents. His temperature was 98° F. There was a hæmorrhage under the skin on the left cheek and extensive hæmorrhages under the skin of both elbows, with a number of pin-point hæmorrhages over the abdomen and some more extensive hæmorrhages over the buttocks and backs of the calves. Albumin was abundant in the urine. A blood count at this time showed:—

Red cells	4,890,000	Polymorph	71 %
White cells ..	27,250	Lymphocytes ..	21 %
Platelets in large numbers.		Endothelial	8 %

Adrenalin, ♏ ii., was given four-hourly, and the pulse-rate varied between 100 and 120 during the first 24 hours, the temperature rising to 99° F. in the evening, and fluid nourishment being well taken during the day. After a restless night, with perpetual complaints of pain in the limbs, there was a rapid advance of the hæmorrhages in all areas where they were previously present; further hæmorrhages developed in the right cheek, and the left ankle-joint became distended with blood.

The waxy yellow colour of the skin of the whole body persisted throughout, contrasting vividly with the deep purple-black in the areas of the hæmorrhages. The child died during the early hours of the second night, with all the appearances of death from hæmorrhage: cold, sweating, sighing respiration, and a failing, increasingly rapid pulse. At no time was blood present in the urine, stools, or vomits; the subcutaneous hæmorrhages were, in the main, present on pressure areas. No post-mortem examination was made of this case.

CASE 2.—The girl, when first seen on March 5th, 21 days from the onset, presented a strikingly distinctive picture. Both calves, from a sharply defined and symmetrical line at the junction of the middle and upper third of the calf downwards, were deeply cyanosed, though warm, while multiple small hæmorrhages were visible in the deep blue skin on the dorsal aspect of each foot. A few pin-point hæmorrhages were also visible over the lower abdomen. Scattered over the posterior surface of the upper arm on both sides and along the outer side of each thigh were white areas of skin, varying from a threepenny-piece to a shilling in size, surrounded by an area of hyperæmia some few millimetres wide.

The temperature was normal, pulse-rate 100, and the general condition of the child good, although vomiting had occurred, as with the brother. The child was a little paler than normal, although there was at this time no sign of the waxy yellow pallor of the previous case. There was abundant albumin in the urine, although it had been absent up to the previous day, daily specimens having been tested during the preceding week. In the course of the next three hours the "blue boots" appearance entirely disappeared, as did the patches on the arms and thighs which had been surrounded by zones of hyperæmia.

Adrenalin, ♏ ii., was administered four-hourly, and liquid liver extract was given by mouth.

Immediate steps were taken to examine the blood with a view to the possibility of a transfusion. This examination revealed a most unusual condition:—

1. The patient belonged to blood group 2.
2. The patient's father was also group 2, the mother being group 4, but the patient's serum agglutinated the cells of both parents.
3. The patient's serum also agglutinated the corpuscles of her sister, who was also blood group 2.
4. The patient's serum also agglutinated the cells of five group 2 donors, and 12 group 4 donors.
5. The patient's serum agglutinated a suspension of her own red cells.

In consultation with Dr. H. Letheby Tidy, it was agreed (*a*) that blood transfusion was impossible, and (*b*) that the administration of serum, after proper precautions to avoid anaphylaxis, might be worthy relative proportion of hæmolysin to leucocidin has ever been proved. The peculiar strain, No. 5, which grows in unusually small colonies on agar (though in its general cultural properties identical with the other strains) was twice isolated from the same patient. The Group 1 strain No. 3 isolated from a carbuncle was again obtained from a stye in the same patient four months later. The association of certain classes of toxin producers with certain types of human lesions is, we think, as close as could reasonably be expected in view of the comparative crudity of our measurements and of variations in the resistance of the individuals affected, and such association supports the belief that toxin production is a constant, at any rate for the period of infection. Clinical instances also occur to us of the accidental transfer of similar staphylococcal lesions from one person to another, for example, a nursemaid with a stye transferring to a child an identical lesion or a small superficial boil.

Toxin and cell species.—A survey of the literature shows that, in estimating toxic action, the animal species from which the test cell was derived seems to have been considered a matter of indifference. Rabbit red and white cells were employed by Neisser [7] and Wechsberg, and subsequently by others, while Julianelle [3] compares the lethal action on mice or rabbits, the hæmolytic titre for horse red cells, and the leucocidal action upon guinea-pig cells. We find that toxins with a high titre for rabbit cells commonly have a lower titre for sheep cells, and may have no action upon human cells. The titre for rabbit cells often reaches 1 in 800, that for human cells rarely attains 1 in 5. Previous saturation of a toxin strongly hæmolytic for rabbit and inactive for human red cells with human cells does not reduce the rabbit cell titre. It is true that a clear zone often appears around staphylococcal colonies on human blood-agar plates, but only one of our 22 strains yielded a titre for human cells of any strength. This toxin (No. 7) gave incomplete hæmolysis throughout with a trace up to 1 in 800 and saturation of this toxin with human cells did not seem to affect the subsequent titre for rabbit red cells. It appears that human and rabbit red cell hæmolysins are distinct, and that staphylococcal toxin rarely acts upon the human red cell in vitro. The leucocidin was tested against human cells, but in some instances was tried against rabbit white cells also. It is difficult to compare these results; the human cell experiments were clear-cut, the rabbit cell results may have been prejudiced by the hæmolysis which was nearly always present, and by what appeared to be the necrosing action of the toxin imposed upon the leucocidal action. It appeared that toxin leucocidal for human cells destroyed rabbit cells also, but toxins with low titres for human cells had considerable action upon rabbit cells. There was some histological suggestion that the main effect of the latter toxins was rather upon the cell membrane than a disruptive action upon both nucleus and cytoplasm as would seem to be the case with the Group 1 toxins.

TREATMENT.

The association of certain combinations of toxins with certain types of staphylococcal infection suggests differences in the specific treatment of these conditions. We have found the employment of an antiserum to be chiefly efficacious against pyæmic infections and have already indicated our belief that the important antibody in the serum is probably the anti-leucocidin. The sycosis cases were, on the contrary, all associated with a strong hæmolysin and a weak leucocidin. These cases notoriously respond badly to vaccine treatment and are sometimes made worse by it. There is also some suggestion that they do worse with an autogenous than with a stock vaccine. In these infections the hæmolysin may be associated with the sensitising factor to which we have previously drawn attention.[8] It appears to us that treatment with toxoid in these and possibly in othe staphylococcal lesions is more rational than treat ment by vaccine, and that in the sycosis cases th toxoid should contain leucocidin and possibly th minimum amount of hæmolysin. We have treate only two such cases but both were carefully selecte as examples of extreme chronicity, widespread lesion and resistance to every form of treatment. Th result in both cases has been sufficiently encouragi to test the method further. Immunisation by tox or toxoid is, in theory, preferable to vaccine therap The vaccine dose comprises a roughly calculat number of dead bacteria, and a very uncertain amou of toxins, mixed in quite unknown proportions. T dose of toxoid can be accurately measured and a choice of toxin the relative proportions of t different constituents can be chosen at will. T comparative values of toxin and vaccine treatm can only be determined by thorough clinical tr

SUMMARY.

(1) Toxic filtrates have been prepared from strains of *Staphylococcus aureus*. Their capacity hæmolyse rabbit red cells, necrose rabbit's skin, destroy the leucocytes in human blood has b estimated. (2) The results confirm the findings others, that the hæmolysin and necrotoxin closely together with no relation to the leucoci (3) The lethal action for rabbits, when investiga was found to vary with the hæmolysin content of filtrate. (4) Comparison with the human les indicates that strains yielding strong leucocidin weak hæmolysin are commonly associated with a severe infections and the reverse combination long-standing superficial infection of the sy type. (5) Up to the present no evidence of varia in the qualitative production of toxins by the st has been obtained. (6) Suggestions as to pos lines of treatment are discussed.

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LUNACY IN THE IRISH FREE STATE.—Acco to the inspection report submitted to the Gr gorman Mental Hospital committee there is a conti increase in the number of persons in the Free of unsound mind; the two institutions of Grangeg and Portrane contain 3750 patients from the count Dublin, Louth, and Wicklow. The report conti "Statistics for the Free State show that one in ever of the population is a patient of a public mental as In addition, there are a large number in private asy workhouses, and hospitals, and a large number are h away in private homes. Add to this the number of n attendants, and other officials engaged in the work of asylums, and you will approach closely to a figure of every 100 of the population not only dead to the but actually a burden to the State. A figure of one in 300 would be a more normal level." Bad housi suggested as one of the causes of mental disorder.

ontaining no excess of white blood-cells. Larger veins ended and contain a large proportion of white cells. iver.—Cellularity along Glisson's capsules.

Blood from Right Ventricle (Differential Count).

Myelocytes	28·2	68·0	 141
Polymorphs	4·0		 20
Transitionals..	35 8		 179
Small lymphocytes	26·2	30·8	 131
Large "	4·6		 23
Endothelials	0·4		 2
Myeloblasts	0·6		 3
Eosinophil myelocytes ..	0·2		 1
	100·0		 500

COMMENTS.

he unusual features of the two cases here reported y perhaps be usefully enumerated.

1) Purpura hæmorrhagica as a late sequela of rlet fever appears to be extremely rare. (2) This nplication developed in two children of the same ily, 16 and 21 days respectively after an attack scarlet fever which clinically was of a mild type l unaccompanied by any evidence of unusual æmia. (3) While the mode of death was charac- istic of death from hæmorrhage, the actual loss of od evident in the one case subjected to post-mortem mination was small in comparison with the clinical emia. (4) In contrast with the case reported by x and Massingham. there was no reduction in the telets. (5) It would seem possible to conclude only that in these children there existed some unusual constitutional susceptibility to the scarlatinal toxin.

While the present paper was in preparation, Dr. F. G. Wood-Smith kindly allowed us to see the report of a similar case occurring in an adult, and with his permission the bibliography is appended.

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CLINICAL AND LABORATORY NOTES

A NOTE ON
HRONIC INFECTIONS OF THE LUNGS.

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NUMEROUS papers have been published describing ronic infection of the lung by fungi, and the istence of streptothrix infections of the lungs is ll established as a clinical and pathological entity.[1] e weight of evidence against the view that monilia non-pathogenic to man is rapidly increasing.[2-8 10] is hardly conceivable that an organism should ert a pathogenic effect when acting alone and t be looked upon as non-pathogenic when associated th known pathogenic organisms.

Since 1922 work has been carried out in Jersey the differential diagnosis of chronic infections of e lungs. The unsatisfactory diagnosis of "closed B." led to the hope of finding an organism which ight be simulating infection with the tubercle cillus. With this in view all specimens of sputum re examined, both microscopically and culturally. The cultural examinations brought to light the esence of blastomycetes, chiefly monilias. Where. clinical grounds, tubercle had been suspected, t the bacillus had not been found, monilias were esent. Monilias were also present in tuberculous fections, and the clinical difference between the ixed infection and the rare condition of a simple berculous infection was marked, the mixed infection ing an acute condition whilst the simple one was ronic, and more resembled a carrier state.

The prevention of secondary infection with pyogenic ganisms is the key to the brilliant results obtained the modern treatment of surgical tuberculosis. he contrast between surgical and medical tubercu- sis lies in the fact that the latter, when seen by the physician, is always complicated by a pyogenic infection, chief of which are monilias. Where tubercle of the lung is a primary and single infection, it does not require treatment, and recovery is natural. This may be a somewhat startling suggestion, but the following further facts are put forward in its support.

The history of a tuberculous patient often includes an attack of a zymotic disease such as whooping-cough or measles, which has left a legacy of bronchitis or broncho-pneumonia. Many cases give a history of pleurisy, and monilias have been recovered from pleural effusions. I have known cases from which monilias have been grown out, and which within a year or so—not having been treated—have developed a secondary infection of tubercle. Chevalier Jackson,[3] using the bronchoscope, has recovered monilias direct from infected lung tissue. N. Hamilton Fairley,[7] in a discussion on a paper by Castellani, refers to the infiltration of lung tissue with gelatinous masses, in which monilia are found in large numbers.

The following Table gives the extent and the results of the work in Jersey during the four years 1927–30.

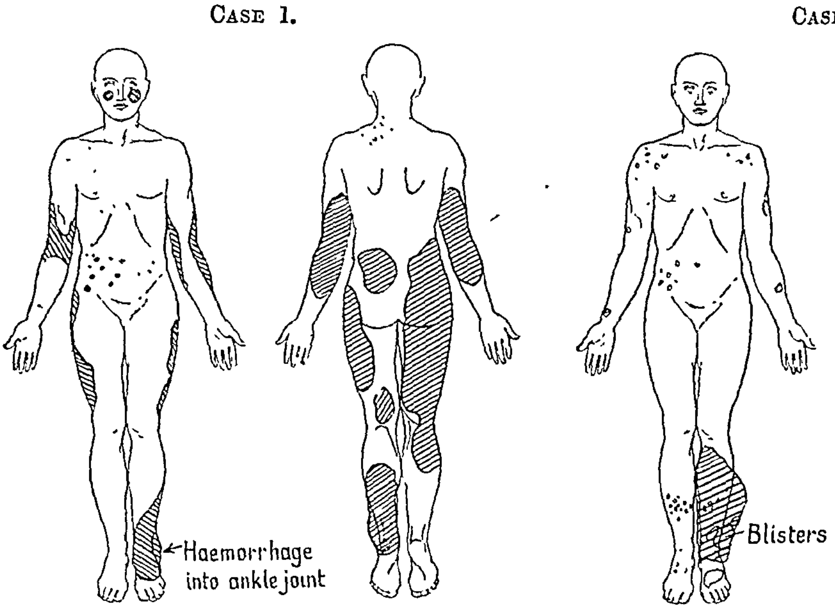
Year	1927	1928	1929	1930
Total number of patients examined ..	295	304	376	381
Number due to T.B., and blastomycetes	80	72	92	79
Number due to blastomycetes only ..	120	160	189	247
Number due to other organisms ..	95	62	94	55

Preventive treatment against infection with monilias consists in the pasteurisation of milk. Cows suffering from mastitis excrete monilias in their milk. Warts on the teats are an indication of the infection.[9]

The keynote to the treatment of chronic infections of the lungs is the removal of pyogenic organisms by drainage. Free drainage brings about improvement, with fall of temperature, clearing-up of the sputum, of consideration, and that anti-scarlatinal serum was probably the serum indicated.

During the second day the hæmorrhages rapidly developed, areas of hæmorrhage appearing on the extensor surfaces of both forearms and buttocks, while the left calf became distended with subcutaneous hæmorrhage to about twice its normal size. Late in the day it was necessary to administer morphia to relieve pain. By the evening of the second day the child was beginning to develop the waxy pallor noted in the first case. Five minims of anti-scarlatinal serum were given subcutaneously without any consequent reaction, and one hour later 5 c.cm. was administered intramuscularly.

The hæmorrhages remained constant, but intense thirst, accompanied by persistent vomiting of all fluid taken by mouth, continued during the night. Rectal salines were given and retained, but the child died during the morning of the third day, the final picture being, as in the case of the first child, death from hæmorrhage.



Distribution of purpura in the two cases.

The total amount of blood extravasated in the different lesions of the second child was small in quantity, and not in itself adequate to account for death.

POST-MORTEM INVESTIGATIONS (A. G. G.).

In Case 2 autopsy was performed 48 hours after death.

The body was moderately nourished. The greater part of the skin of both legs below the calf was purple and ecchymotic, and there were large blebs containing blood in the left leg. There were patches of purpura on the buttocks and on the extensor surfaces of both hands and wrists, and smaller petechial hæmorrhages in the upper arms. There were 2–3 c.cm. of clear fluid in the pericardium; otherwise the cavities were dry and natural. There was a local hæmorrhage in the fat of the anterior mediastinum near the pericardium.

Tonsils and lymph glands.—Both tonsils were large, pale, and on section extremely cellular, showing no crypts except one near the surface of the left tonsil which exuded mucoid, opaque fluid. There were no hæmorrhages. The neck glands below the tonsils were slightly enlarged, and on section showed the same highly cellular appearance. The tongue, pharynx, œsophagus, trachea, thyroid, and aorta were normal. The glands at the bifurcation of the trachea were small, fleshy, and dark red.

Thorax.—The heart seemed natural, with no sign of hæmorrhage; the muscle was on the pale side, but of good texture and colour. Both lungs showed moderate hypostasis, and there were a few minute petechiæ underneath the pleura. They were otherwise dry and showed no change.

Abdomen.—The mucous membrane of the stomach and intestines was normal. The liver was slightly brownish, firm, and showed the lobules under a low magnification. There were no visible hæmorrhages. The spleen was not enlarged. There was a hæmorrhage on the convex surface towards the upper pole; it had not spread for any distance into the pulp. The pulp was firm, Malpighian bodies were easily seen, and most of them had a zone of hyperæmia surrounding them. The suprarenals were thin, and the pigment layer in the lowest part of the cortex was evident. Both kidneys were pale and showed no abnormal change. The bone-marrow of the ribs was slightly paler than normal, otherwise without change. Incision into the hæmorrhage in the right leg showed that it was entirely superficial to the periosteum of the tibia, which was normal in appearance.

MICROSCOPICAL APPEARANCES.

Left tonsil.—Very highly cellular and cannot be recognised as a tonsil under the low power. Crypts that can be recognised under the high power are small cavities lined by a single layer of epithelium. The sites of other crypts probably represented by areas in which with some thelial and lymph cells there are numerous small glob bodies, possibly from nuclear necrosis. No mye *metaplasia.* The tonsillar glands show extreme lymp hyperplasia.

Right tonsil.—The crypts can be distinguished, and w the walls of some are infiltrated with lymphocytes s are normal, but none contains pus. There are several l fibrous strands in this tonsil infiltrated with lymphoc Areas of necrosis are less evident than in the left.

Spleen.—Hæmorrhage surrounds some of the Malpig bodies. Some of the sinusoids are plugged with hy clot. A section of the hæmorrhage showed the ti turgid with blood. Malpighian corpuscles s Veins have more white cells than normal. *No* hy plasia.

Thymus.—Lymphatic tissue normal. Of Hassal's puscles some are normal, some distended with epith debris. No suggestion of infection.

Bronchial gland.—Hyperplasia with patches of (?) nec as in tonsil. Hyperæmia. Increase of white cells in s vessels.

Mesenteric gland.—Hyperplasia.

Bone-marrow of ribs.—Packed with neutrophil and a eosinophil myelocytes. Normoblasts present.

Mediastinal hæmorrhage.—Some parts appear wit more than a normal number of white cells. O contain an excess. Two small vessels are packed white cells.

Skin.—The hæmorrhage here does not contain a l number of white cells (cf. the splenic and medias [illegible] on of tissue or blood-cells [illegible] om capillaries. [illegible] seen in the vessels; the arter [illegible] mal. No signs of neph A few blood-cells in glomerular capsule. Capillaries en

MEDICAL SOCIETIES

HUNTERIAN SOCIETY.

Ætiology of Chronic Bronchitis.

: the course of his Hunterian Oration, delivered ie Apothecaries' Hall to this society on Feb. 25th, J. B. Christopherson pointed out that chronic .chitis is prevalent in all walks of life. There .o commoner disorder in England, and there o more frequent, direct and indirect, cause of blement and death in the British Isles. Dr. stopherson's main thesis was that besides the ubtedly bacterial invasion of the bronchial ous membrane, there is a more fundamental e underlying chronic bronchitis, of nervous origin. frequent and intimate association with asthma, the well-established fact that asthma is anatomi- due to constriction of the bronchial muscle, first led him to think that chronic bronchitis it be caused by over-action of the sympathetic h, with the vagus, controls the bronchi. He ved the turgescence of the mucous membrane, he bronchioles of chronic bronchitis patients, e an anatomical fact of the greatest importance. turgescence was recognised by important orities as an essential part of the asthma syndrome according to Dr. Christopherson, it is probably ultimate cause of death, in the majority of ents, who die of chronic bronchitis and bronchial ma. He did not concur with the general opinion the whole pathology of chronic bronchitis is erial, and that the turgescence is inflammatory ature; in his view there exists a non-bacterial escence of chronic bronchitis, which owes its e to the action of the involuntary nervous em. There was not as yet sufficient experimental f as to whether it was produced by vagal or pathetic action. He discussed the evidence avour of regarding chronic bronchitis as (1) a erial, (2) a vasomotor disease, and proceeded to ider the clinical evidence suggesting a connexion een chronic bronchitis and the involuntary ous system, especially over-action of the sympa- ic. He pointed out that an asthmatic child itted to hospital with an acute attack of spasmodic ma will recover from his asthma in a few hours out relapsing, but the wheezing râles remain gh there is no obstruction to air entry. He rded the asthmatic attack as vagal, and the e following the attack as the reacting sympathetic ion of the vago-sympathetic complex—vascular escence and dilatation of bronchial musculature.

r. Christopherson thought that the fact that nic bronchitis frequently dates from an acute rder of the lungs might possibly find its explana- in the hypothesis that the normal vago-sympa- ic balance has been destroyed by the acute illness. fact that chronic bronchitis and asthma frequently rnate suggested a relationship of physiological nce, the vagal influence dominating at one time, the sympathetic influence dominating at another. was an interesting fact that in bronchial asthma paroxysms occur at night when sympathetic nuli are in abeyance. Chronic bronchitis was a time disease, when sympathetic influences are ongest. Another possible instance of a fluctuating siological balance was that, during the asthmatic sm the cough is hard, expectoration scanty; after spasm, when the sympathetic influences are inning to dominate, the cough is loose and expectoration increases. He believed hypertrophy of the submucous tissue to be a sympathetic phenomenon; it was the most serious part of the vago-sympathetic complex. In the cases of asthma operated on by sympathectomy, a number of successes had been reported. Spasmodic asthma being a vagal disorder, sympathectomy could only benefit by cutting out any sympathetic phenomena present. Reported successes following operation on the sympathetic nerve, in cases of asthma, might be due to the fact that the operator had attacked and relieved the sympathetic portion of the asthma complex. There appeared to be no recognisable pathological difference post mortem between chronic bronchitis and bronchial asthma. The problem of chronic bronchitis was a complicated one, and it might be that bacterial influences must also be considered, and perhaps linked up with the physiological. It was possible to link the undoubtedly inflammatory forms of bronchitis with the admitted nervous disturbance in asthma, and to account for the numerous cases, which seemed to fall between the two extremes, on the basis of bacterial allergy. If chronic bronchitis was clinically a part of the vago-sympathetic complex of asthma, asthma and bronchitis might profitably be investigated together. The success of adrenalin as a stimulant of the sympathetic nerve encouraged the hope that a rival antagonistic substance—pharmacological or biochemical, or of the acetyl-choline type—might be found to stimulate the bronchial vagus without risk.

ROYAL SOCIETY OF MEDICINE.

SECTION OF COMPARATIVE MEDICINE.

Milk Fever and Similar Conditions.

At a meeting of this section on Wednesday, Feb. 24th, Dr. J. A. Arkwright, F.R.S., the President, being in the chair, a discussion took place on Milk Fever in Parturient Cows and Similar Conditions in Other Animals and the Human.

Prof. J. Russell Greig, in opening, said that the pathology of the condition known as milk fever in cows, like that of eclampsia in women, to which it bore a clinical resemblance, had long been obscure. In most instances it attacked cows within 72 hours after calving, the parturition itself having been uneventful. The onset of the milk fever was usually abrupt; the first symptom was excitement, and this was followed by tetany, which might be confined to the hind limbs, or might involve all four limbs. Convulsive seizures, when they occurred, rapidly led to coma. In 1897 Schmidt discovered that the injection of fluid into the mamma produced prompt and complete cure. This injection method was later replaced by inflation of the breast. These measures had reduced mortality from between 60 per cent. and 70 per cent. to less than 1 per cent.—a remarkable result. It was not clear how mammary inflation produced the cure. In 1924 jointly with Prof. H. Dryerre, Prof. Greig had formulated a working hypothesis in which it was suggested that the essential condition was a parathyroid deficiency with a fall in the blood calcium, the latter deficiency being accentuated by lactation. The colostrum of the cow revealed a very high concentration of calcium. Mammary inflation produced, he submitted, a stimulation of adrenal secretion, and consequently increased the excretion of any toxins which might be present;

and increase in weight. Any recurrence of symptoms is found to be due to a relapse of the monilia infection. Pneumothorax and aspiration by the bronchoscope are simply surgical methods of drainage, but such treatment is applicable to gross lesions. Medical treatment requires the institution of medical drainage at the earliest possible moment. When sputum is tenacious, there can be no free flow of secretion. When a thick purulent or gelatinous sputum is present, culture will usually reveal the presence of monilias, and on the finding of monilias, medical drainage must be commenced.

Alkaline potassium iodide is the drug for the purpose; it acts in the following ways: (*a*) sputum is liquefied; (*b*) a free flow of secretion is set up from within outwards, thus preventing the ingress of organisms; and (*c*) the drug has a selective action on fungi. It has been stated that iodides tend to decalcify the body. What effect has chronic suppuration on the calcium content of the body? If iodides do decalcify, then the answer is: replace the calcium loss by the exhibition of a calcium salt.

Vaccines are used to increase immunity against monilia. The vaccine is used in two forms. A first course consists of monilia grown on agar; this only contains the yeast form. When monilia persists after a first course, a second course is given where the monilia is grown on Sabouraud; the vaccine thus grown contains all elements of monilia, including mycelium. Tubercle vaccine is only used when the patient is apyretic. If acute symptoms return a cultural examination of the sputum is made, and if monilia is found, the patient reverts to monilia vaccine.

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RUPTURE OF AN ANEURYSM OF THE ABDOMINAL AORTA.

BY J. H. PEEL, B.M. OXF.,

HOUSE SURGEON TO THE UROLOGICAL DEPARTMENT, KING'S COLLEGE HOSPITAL, LONDON.

A WOMAN, aged 68, admitted to King's College Hospital, said she had suffered for a number of years from what she called rheumatism. But the illness which brought her into hospital started only three weeks prior to admission, before which she had been comparatively healthy.

She complained of pain in the right lumbar region. It was never very acute, but a dull heavy ache, localised in the right loin. She began to feel very ill, complaining of nausea and loss of appetite at first, and later she began to vomit. For a few days before admission she had been unable to keep any food down at all. She felt very thirsty but she vomited even water. Hiccup started three days previously, and had been persistent up to the time of admission. She had gradually become more drowsy and apathetic. The bowels had been very constipated; hæmaturia, which had been noticed for a week, had persisted, but there had been no frequency or pain on micturition. The illness had started with a febrile attack, and the temperature had remained elevated for the whole three weeks prior to admission. Before the hæmaturia started there was no albumin or pus in the urine.

When the patient was first seen, she presented a typical picture of uræmia. She was very drowsy, could only be roused with difficulty, and talked incoherently. The tongue was red and very dry. There was persistent hiccup and the patient kept retching and vomiting. She was parched with thirst. The temperature was 100·6°, the pulse-rate 100, and the respiration-rate 22. The pulse was poor in volume, although the blood pressure was 160/90. There was slight twitching of the left eye; the discs were normal On examination of the abdomen there was found to be a large firm tumour in the region of the left kidney. The swelling was tense and very tender, but was not absolutely fixed. There was a transmitted pulsation.

Examination of a catheter specimen of urine showed the presence of a number of red blood-cells and pus cells. There were no casts, crystals, or epithelial cells seen, and no organisms in direct smears. The culture was proved subsequently to be sterile. The blood-urea was found to be 217 mg. per 100 c.cm.

The diagnosis of a renal tumour causing uræmia seemed reasonable, and the patient was treated accordingly. She was given one pint of saline with 5 per cent. glucose subcutaneously, and this wa given again intravenously six hours later. She wa given purgatives and diuretics as well. For severa hours the general condition improved considerably the vomiting almost stopped, and the patient was les drowsy and more coherent. Quite suddenly abou 12 hours after admission she collapsed and died.

Post-mortem revealed an astonishing and une pected condition. On opening the peritoneal cavit it was found to contain nearly two pints of free bloo The tumour in the kidney region was an enormou perinephric hæmatoma, about the size of a melo completely enveloping a small arterio-sclerotic kidne The right kidney was also a small arterio-sclerotic on This was apparently the explanation of the rais blood pressure and the undoubted uræmia. T whole of the aorta (thoracic and abdominal) show marked syphilitic scarring. There was a rupture the aorta about 1½ in. above the bifurcation the aorta on the left side, communicating with aneurysmal sac the size of an orange. Leakage fr this had caused the perinephric hæmatoma, a further rupture of this into the peritoneum h caused the terminal hæmorrhage, from which t patient died suddenly. The aortic valves show early syphilitic lesions. There was a gumma in t liver adjacent to the gall-bladder and adherent the second part of the duodenum.

This case is recorded by kind permission of J. Everidge.

WEST SUSSEX CONTRIBUTORY FUND.—Five yea working of this scheme has resulted in a members of approximately 17,800, and during this period sum of £16,461 19*s.* 8*d.* has been paid to the ass ated hospitals for treatment of members; 853 memb or their dependents, benefited as in-patients, and 1447 out-patients. Of these, 757 and 1407 respectively w treated in associated hospitals, the remainder going other hospitals in Sussex. These figures are exclusive children of members treated under the county council tonsils and adenoids, and dental treatment paid for by fund. While the committee is satisfied with the ste progression of the fund—there was an increase of just c £400 in income during 1931—it is pointed out in the annual report "that in some outlying districts served the smaller associated hospitals, the idea is still preva that the fund belongs to the Royal West Sussex Hospi and that local prople do not realise that their own hosp is just as much a part of the fund as the larger one." suggestion is made that if all the associated hospitals t individual steps to identify themselves with the fund in t own localities, this false impression would soon be remov and result in an immediate increase of membership. A v satisfactory feature of the working of the fund during 1 was the complete liquidation of a suspense account wh was opened at a bank to finance the formation of the fu atical. was closely allied to the eclampsia found nen. In women the toxæmias of pregnancy d chiefly in strong and well-developed multi- in cows also the disease occurred mostly in good milkers. not in the first pregnancies, er two or three calves had been born. In cows yielded 30 to 35 litres of milk a day the whole ontent of the animal was no more than 45 litres. had been suggested that in these cows the blood too concentrated. When thinking of the us quantity of milk excreted, it was easy to how much blood must pass from the liver e systemic blood; in eclampsia. he believed, was too great a rush of blood through the ry paths of the liver. causing a poisoning general system. Prof. Greig had said he did d a rise in the blood pressure after carrying flation of the mamma. But if one occluded capillary area. a rise of blood pressure must and if this was not evident. it must mean that was an increased flow through some other eral part. After mammary inflation there was excretion and a diminished flow through the system; the systemic blood became purified, t the animal got well. As to the way in which n acted, it had been shown that carbon loride poisoning in dogs could be prevented rior administration of calcium; Prof. Browne t that the only way the calcium could act y stimulating the hepatic cells. Lack of n resulted in paralysis of tissue cells. so depleting iciency of the liver cells which were stimulated cium therapy.

. F. W. **Wooldridge** said he had often seen len restoration of consciousness in cows as a of inflation of the udder in milk fever: the nce produced in twenty minutes was very sive. If the condition was one of hypo- mia. it was difficult to understand how inflation udder could influence it. In his view hypo- mia was one of the effects of the disease known lk fever, not the cause. If that was so, Prof. e's theory as to the action of calcium on the ells fell to the ground as an explanation of the n recoveries after inflation. He did not think ause of the condition had yet been found. tly he saw a milch goat which had been a very milker. Five months previously a kid had born to it. It was fatigued after a long railway y. refused its food. and the milk fell off almost . After three days it showed all the symptoms ied as typical of milk fever. He decided to der inflation empirically: within fifteen minutes at. from being apparently dead, raised its head, cabbage. and a few minutes later was standing r feet. His own suggestion was that the disease neurosis of some kind. though he had no theory how it was produced.

SECTION OF ORTHOPÆDICS.

a meeting of this section. held on March 1st. hair was taken by the President. Mr. **Harry** r, and a discussion on

Fractures Round the Ankle-joint

opened by Mr. R. **Broomhead**. He classified ure dislocations of the ankle-joint into adduction abduction fractures. Both were, he said. due ndirect violence. the former to torsion and the r to simple leverage. There were three degrees e abduction type: (1) when the internal lateral nent was intact: (2) when the ligament was torn or the malleolus fractured: and (3) when. in addition. the astragalus was misplaced or the posterior margin of the tibia was fractured. The third degree type proved difficult to reduce, and restoration of function was hard. Treatment depended on the displacement. Those without displacement did not require immobilisation. Walking might be commenced early. with a firm though mobile support. When there was displacement. reduction was easy if it was possible at all; the others usually required open operation. Inversion should be obtained by inverting the back-foot and not by twisting the fore-foot. Adduction fractures were much more unstable. and should be fixed at a right angle. One of the best-known and most widely used methods of ambulatory treatment was Delbet's. Patients could walk about quite well if a special shoe were fitted over the plaster. Other forms of treatment included Böhler's. which was one of the most practical, although he did not allow walking until all swelling had subsided. Plaster was ideal as a protective splint. but not so useful as a corrective. and fractures with displacement were better treated in bed. There was no evidence that return to work was possible any earlier after the plaster methods.

Operation was to be advised in some third degree abduction fractures. some second degree adduction fractures. and all compound fractures. The skin of the foot had great potentialities for sepsis. and operation should be delayed until the skin had been prepared and the swelling had subsided. In adduction fractures the internal malleolus and in abduction fractures the external malleolus must be fixed. and often the posterior tibial margin as well. One alternative was to fuse the ankle-joint after all swelling had subsided—in about a fortnight; the other was to do all that could be done by conservative treatment at first. and then to fuse the joint in six months' time if function was inadequate. Vaseline pack dressings had proved very satisfactory for compound fractures. Amputation was often worth consideration as an immediate measure. as it saved a long and painful period of treatment with a useless joint as the result. It was very important—and often difficult—to get early and complete reduction in cases of separated epiphysis.

General anæsthesia was preferable; local anæsthetics had proved disappointing. Some 20 c.cm. of fluid had to be introduced into an already swollen limb. and often spasm of the peroneal muscles was not abolished by the injection, so that the displacement recurred as soon as the hands were removed. These fractures had great importance in relation to compensation claims. Return to work should be possible in eight to ten weeks. If there was displacement with marginal fracture the patient was usually disabled for 16 to 18 weeks, and often up to six months.

FRACTURES OF THE ASTRAGALUS.

Mr. J. P. **Hosford** said that he had only found 15 cases (in 13 patients) of fracture of the astragalus at St. Bartholomew's Hospital in the last ten years. The neck was the part most commonly broken, and the ankle-joint might or might not be involved. The cause was seldom a direct blow as the astragalus was so well protected, and in twisting strains the malleoli fractured more easily than the astragalus. The most usual history (in nine cases) was a fall on to the heel from a height. and often there was some other gross lesion in the tarsus or a subastragaloid dislocation. There were four types: *fractures of the neck*: fractures of the posterior process; crush-

or it caused a reduction of the milk secretion and a further transference of calcium from the blood to the milk. The curative effect of inflammation of the mamma was due to the restoration to that organ of its due blood calcium. Once an animal had been attacked by this malady there were likely to be recurrences at the subsequent calvings. In every case of milk fever investigated the blood calcium was deficient. Moreover the progress of cure, as manifested in the disappearance of symptoms, corresponded with the rise in the blood calcium, which remained abnormally high for five days. As would be expected, the injection of calcium salts cured the condition. The recovery of the cow from its torpor and helplessness after treatment was dramatic; very definite improvement was noted in five minutes, the change being especially rapid when the injection was intravenous.

The calcium deficiency might have its basis in a parathyroid deficiency, or there might be a great loss of calcium in the milk. There was as much calcium in half a gallon of colostrum as in the whole of the soft tissues of the body. Possibly mammary distension cured the disease by preventing a further transference of calcium from the blood to the milk. In ewes there occurred a "lambing sickness" which was much akin to the condition just mentioned. Investigation of a series of cases showed the following blood calcium contents:—

		Normals.	Lambing sickness.
mg. per 100 c.cm. of serum.	Maximum ..	11·92	5·94
	Minimum ..	7·92	3·51
	Average ..	9·80	4·10

These figures were confirmed in an investigation by Sjollema. Mares suffered from a similar disease, and they responded with equal suddenness to mammary inflation or injection of calcium salts; the same was true of the parturient goat, sow, and bitch.

As milk fever appeared to represent a metabolic upset and seemed to occur in all domesticated animals, it was reasonable to assume that a similar condition occurred in woman, and there were parallel symptoms in eclampsia. The blood condition in the two was, however, markedly dissimilar. In serious cases of eclampsia inflation of the breasts gave no response, and the results of calcium injections in this disease had not been encouraging. Yet a case of eclampsia recorded in 1931 by Dr. J. G. Kinnimonth suggested that a condition which was pathologically related to milk fever in domestic animals did occur in the human; the symptoms here closely resembled those of milk fever in the cow, and prompt and complete recovery followed inflation of the breasts. There was also some parallelism between eclampsia and a disease in ewes known as pregnancy toxæmia.

Prof. DRYERRE, who had been investigating ewes, said that the ewe was sometimes affected before the lamb was born. He was convinced that many cases of pregnancy toxæmia in ewes were confused with those of lambing sickness. Some writers had had no success with calcium injections in lambing sickness, but Prof. Dryerre suggested that their cases were really those of pregnancy toxæmia. Some confusion was natural, since in both conditions the animal was unsteady of gait, and liable to fall, and might be almost comatose. Calcium salts had no effect in the toxæmia of pregnancy—indeed, their injection might hasten the fatal termination. In an investigated series there was no significant difference in the blood calcium or the potassium content; between the normal animal and the animal suffering from pregnancy toxæmia; the magnesium showed a slight difference, and the inorganic phosphorus in pregnancy toxæmia was lower than the normal. There was a fall of blood calcium in eclamptic cases, but not to a significant extent, and it was thus not likely to be a causal factor.

Prof. E. C. DODDS referred to an investigation he had conducted into tetany as manifested in some Welsh mountain ponies, which had been captured on the hills and transferred in railway trucks. These animals developed an illness bearing a clinical resemblance to milk fever; their blood calcium was low and restoration followed the giving of calcium intravenously or subcutaneously. In these animals there was no calcium loss to account for the low bloo calcium; his view was that the fright induced b their capture and the railway journey induced a alkalosis. If so, there was no need to postulate loss of calcium in the milk. He considered that an attempt to establish a parallelism between the mi fever of cows and eclampsia in the human was doom to failure. While in milk fever the blood calcium w said to be always low, in eclampsia the blood calciu might or might not be low, bile pigment might in the blood, or the blood-urea might be high. T other great difference between milk fever and eclamps was in the blood pressure. The latter provided t best indication to the prognosis in a case of eclamps Apparently in the cow the blood pressure was n high after inflation of the udder. From a search the literature, he had come to the conclusion that t only condition comparable in women to milk dise in cows was lactation tetany, which was sometin found in women who prolonged lactation nine months, or over. He asked whether alkalo was considered a reasonable explanation of symptoms in domestic animals; it seemed to easily excited.

Mr. W. L. LITTLE said he had had experience milk fever in the cow, the goat, and the dog, and able to trace a number of disabilities following u insufficient diets. The cow needed much lime. felt sure that an excess of phosphates interfered w the assimilation of the calcium, and in this cour the diet of most cows was fairly rich in phospha As milk fever was prevalent on some farms very rare on others, he suggested that the ex phosphorus taken might interfere with the calc assimilation. The best results had followed wi feeding on a combination of cod-liver oil and calc salts. Injection of calcium salts just after cal prevented the onset of the disease on farms wl it was prevalent. Autopsies on a number of c of milk fever showed that in most of the cases the de was from septic pneumonia. In deaths occur after very severe attacks there were changes in muscles, the affected muscles showing a dry nec and blood extravasation between the fibres. In kidneys and bladder small hæmorrhages were evid He advised that calcium injections should be gi very slowly.

Mr. O. STINSON spoke of his experiences with ca on two farms in Westmorland very dissimila the matter of soil. In one the cattle showe distinct aphosphorosis; if the animals were tr ferred to the other farm for a time these sympt disappeared.

Prof. F. J. BROWNE did not feel able to acc Prof. Greig's explanation of interpretation. Tho there might be hypoglycæmia in the blood of t animals, he did not think the essential pathol of the disease was due to that. What was the c of the deficiency in the function of the parathy gland? He thought the condition in cows, though ntical, was closely allied to the eclampsia found women. In women the toxæmias of pregnancy urred chiefly in strong and well-developed multi- æ; in cows also the disease occurred mostly in ong good milkers, not in the first pregnancies, t after two or three calves had been born. In cows ich yielded 30 to 35 litres of milk a day the whole od content of the animal was no more than 45 litres, d it had been suggested that in these cows the blood ame too concentrated. When thinking of the ormous quantity of milk excreted, it was easy to ture how much blood must pass from the liver o the systemic blood; in eclampsia, he believed, re was too great a rush of blood through the illary paths of the liver, causing a poisoning the general system. Prof. Greig had said he did t find a rise in the blood pressure after carrying t inflation of the mamma. But if one occluded arge capillary area, a rise of blood pressure must sue, and if this was not evident, it must mean that re was an increased flow through some other ripheral part. After mammary inflation there was ater excretion and a diminished flow through the rtal system; the systemic blood became purified, that the animal got well. As to the way in which cium acted, it had been shown that carbon rachloride poisoning in dogs could be prevented a prior administration of calcium; Prof. Browne ought that the only way the calcium could act s by stimulating the hepatic cells. Lack of cium resulted in paralysis of tissue cells, so depleting e efficiency of the liver cells which were stimulated calcium therapy.

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AT a meeting of this section, held on March 1st, e chair was taken by the President, Mr. HARRY LATT, and a discussion on

Fractures Round the Ankle-joint

as opened by Mr. R. BROOMHEAD. He classified racture dislocations of the ankle-joint into adduction nd abduction fractures. Both were, he said, due o indirect violence, the former to torsion and the atter to simple leverage. There were three degrees f the abduction type: (1) when the internal lateral igament was intact; (2) when the ligament was torn or the malleolus fractured; and (3) when, in addition, the astragalus was misplaced or the posterior margin of the tibia was fractured. The third degree type proved difficult to reduce, and restoration of function was hard. Treatment depended on the displacement. Those without displacement did not require immobilisation. Walking might be commenced early, with a firm though mobile support. When there was displacement, reduction was easy if it was possible at all; the others usually required open operation. Inversion should be obtained by inverting the back-foot and not by twisting the fore-foot. Adduction fractures were much more unstable, and should be fixed at a right angle. One of the best-known and most widely used methods of ambulatory treatment was Delbet's. Patients could walk about quite well if a special shoe were fitted over the plaster. Other forms of treatment included Bohler's, which was one of the most practical, although he did not allow walking until all swelling had subsided. Plaster was ideal as a protective splint, but not so useful as a corrective, and fractures with displacement were better treated in bed. There was no evidence that return to work was possible any earlier after the plaster methods.

Operation was to be advised in some third degree abduction fractures, some second degree adduction fractures, and all compound fractures. The skin of the foot had great potentialities for sepsis, and operation should be delayed until the skin had been prepared and the swelling had subsided. In adduction fractures the internal malleolus and in abduction fractures the external malleolus must be fixed, and often the posterior tibial margin as well. One alternative was to fuse the ankle-joint after all swelling had subsided—in about a fortnight; the other was to do all that could be done by conservative treatment at first, and then to fuse the joint in six months' time if function was inadequate. Vaseline pack dressings had proved very satisfactory for compound fractures. Amputation was often worth consideration as an immediate measure, as it saved a long and painful period of treatment with a useless joint as the result. It was very important—and often difficult—to get early and complete reduction in cases of separated epiphysis.

General anæsthesia was preferable; local anæsthetics had proved disappointing. Some 20 c.cm. of fluid had to be introduced into an already swollen limb, and often spasm of the peroneal muscles was not abolished by the injection, so that the displacement recurred as soon as the hands were removed. These fractures had great importance in relation to compensation claims. Return to work should be possible in eight to ten weeks. If there was displacement with marginal fracture the patient was usually disabled for 16 to 18 weeks, and often up to six months.

FRACTURES OF THE ASTRAGALUS.

Mr. J. P. HOSFORD said that he had only found 15 cases (in 13 patients) of fracture of the astragalus at St. Bartholomew's Hospital in the last ten years. The neck was the part most commonly broken, and the ankle-joint might or might not be involved. The cause was seldom a direct blow as the astragalus was so well protected, and in twisting strains the malleoli fractured more easily than the astragalus. The most usual history (in nine cases) was a fall on to the heel from a height, and often there was some other gross lesion in the tarsus or a subastragaloid dislocation. There were four types: fractures of the neck; fractures of the posterior process; crush-

or it caused a reduction of the milk secretion and a further transference of calcium from the blood to the milk. The curative effect of inflammation of the mamma was due to the restoration to that organ of its due blood calcium. Once an animal had been attacked by this malady there were likely to be recurrences at the subsequent calvings. In every case of milk fever investigated the blood calcium was deficient. Moreover the progress of cure, as manifested in the disappearance of symptoms, corresponded with the rise in the blood calcium, which remained abnormally high for five days. As would be expected, the injection of calcium salts cured the condition. The recovery of the cow from its torpor and helplessness after treatment was dramatic; very definite improvement was noted in five minutes, the change being especially rapid when the injection was intravenous.

The calcium deficiency might have its basis in a parathyroid deficiency, or there might be a great loss of calcium in the milk. There was as much calcium in half a gallon of colostrum as in the whole of the soft tissues of the body. Possibly mammary distension cured the disease by preventing a further transference of calcium from the blood to the milk. In ewes there occurred a "lambing sickness" which was much akin to the condition just mentioned. Investigation of a series of cases showed the following blood calcium contents:—

		Normals.	Lambing sickness.
mg. per 100 c.cm. of serum.	Maximum ..	11·92	5·94
	Minimum ..	7·92	3·51
	Average ..	9·80	4·40

These figures were confirmed in an investigation by Sjollema. Mares suffered from a similar disease, and they responded with equal suddenness to mammary inflation or injection of calcium salts; the same was true of the parturient goat, sow, and bitch.

As milk fever appeared to represent a metabolic upset and seemed to occur in all domesticated animals, it was reasonable to assume that a similar condition occurred in woman, and there were parallel symptoms in eclampsia. The blood condition in the two was, however, markedly dissimilar. In serious cases of eclampsia inflation of the breasts gave no response, and the results of calcium injections in this disease had not been encouraging. Yet a case of eclampsia recorded in 1931 by Dr. J. G. Kinnimonth suggested that a condition which was pathologically related to milk fever in domestic animals did occur in the human; the symptoms here closely resembled those of milk fever in the cow, and prompt and complete recovery followed inflation of the breasts. There was also some parallelism between eclampsia and a disease in ewes known as pregnancy toxæmia.

Prof. DRYERRE, who had been investigating ewes, said that the ewe was sometimes affected before the lamb was born. He was convinced that many cases of pregnancy toxæmia in ewes were confused with those of lambing sickness. Some writers had had no success with calcium injections in lambing sickness, but Prof. Dryerre suggested that their cases were really those of pregnancy toxæmia. Some confusion was natural, since in both conditions the animal was unsteady of gait, and liable to fall, and might be almost comatose. Calcium salts had no effect in the toxæmia of pregnancy—indeed, their injection might hasten the fatal termination. In an investigated series there was no significant difference in the blood calcium or the potassium content; between the normal animal and the animal suffering from pregnancy toxæmia; the magnesium showed a slight difference, and the inorganic phosphorus in pregnancy toxæmia was lower than the normal. There was a fall of blood calcium in eclamptic cases, but not to a significant extent, and it was thus not likely to be a causal factor.

Prof. E. C. DODDS referred to an investigation he had conducted into tetany as manifested in some Welsh mountain ponies, which had been captured on the hills and transferred in railway trucks. These animals developed an illness bearing a clinical resemblance to milk fever; their blood calcium was low, and restoration followed the giving of calcium intravenously or subcutaneously. In these animals there was no calcium loss to account for the low blood calcium; his view was that the fright induced by their capture and the railway journey induced an alkalosis. If so, there was no need to postulate a loss of calcium in the milk. He considered that any attempt to establish a parallelism between the milk fever of cows and eclampsia in the human was doomed to failure. While in milk fever the blood calcium was said to be always low, in eclampsia the blood calcium might or might not be low, bile pigment might b in the blood, or the blood-urea might be high. Th other great difference between milk fever and eclampsi was in the blood pressure. The latter provided th best indication to the prognosis in a case of eclampsi Apparently in the cow the blood pressure was n high after inflation of the udder. From a search the literature, he had come to the conclusion that t only condition comparable in women to milk disea in cows was lactation tetany, which was sometim found in women who prolonged lactation f nine months, or over. He asked whether alkalo was considered a reasonable explanation of t symptoms in domestic animals; it seemed to easily excited.

Mr. W. L. LITTLE said he had had experience milk fever in the cow, the goat, and the dog, and able to trace a number of disabilities following u insufficient diets. The cow needed much lime. felt sure that an excess of phosphates interfered w the assimilation of the calcium, and in this coun the diet of most cows was fairly rich in phospha As milk fever was prevalent on some farms very rare on others, he suggested that the ex phosphorus taken might interfere with the calc assimilation. The best results had followed wi feeding on a combination of cod-liver oil and calc salts. Injection of calcium salts just after cal prevented the onset of the disease on farms w it was prevalent. Autopsies on a number of c of milk fever showed that in most of the cases the d was from septic pneumonia. In deaths occur after very severe attacks there were changes in muscles, the affected muscles showing a dry nec and blood extravasation between the fibres. In kidneys and bladder small hæmorrhages were evid He advised that calcium injections should be g very slowly.

Mr. O. STINSON spoke of his experiences with ca on two farms in Westmorland very dissimila the matter of soil. In one the cattle showe distinct aphosphorosis; if the animals were tr ferred to the other farm for a time these sympt disappeared.

Prof. F. J. BROWNE did not feel able to ac Prof. Greig's explanation of interpretation. Th there might be hypoglycæmia in the blood of t animals, he did not think the essential patho of the disease was due to that. What was the c of the deficiency in the function of the parathy gland? He thought the condition in cows, though

REVIEWS AND NOTICES OF BOOKS

htheria, Past and Present.

ts Ætiology, Distribution, Transmission. and revention. By J. Graham Forbes, M.D., R.C.P., D.P.H., Principal Assistant Medical fficer, London County Council. With an intro- uctory note by Sir Frederick Andrewes, M.D., R.S. London : John Bale, Sons and Danielsson, td. 1932. Pp. 832. 45*s*.

r. Graham Forbes presents in this volume of some pages what is probably the most comprehensive unt of diphtheria, considered from the public lth and preventive aspects, which has ever been mpted. As regards prevention, at least, it is ost literally accurate to say that the survey ends from China to Peru. The last publication diphtheria comparable in importance with the sent work was the monograph by several authors, ed by the Medical Research Council in 1923. that monograph diphtheria was discussed chiefly n the bacteriological and pathological aspects, ough the methods of specific prevention then ilable were brought under review ; the last few rs have seen diphtheria added definitely to the of preventable diseases. Dr. Graham Forbes ides his book, which is founded upon his Milroy ures of 1929, into four sections dealing respectively h ætiology, distribution, transmission, and pre- tion. Each section is abundantly furnished with ps, charts, and statistical tables which add to the ue and clearness of the text. The section on vention occupies about half the book, and rightly since it is by far the most important.

he first three sections present a very complete ture of the natural history of diphtheria in England Wales. The incidence of the disease in the nties and large cities is discussed in detail and ealth of epidemiological data is supplied. These tions form a background, which, it is to be hoped, y come to be chiefly a historical background to section on prevention. Here the first steps the displacement of diphtheria as one of the lemic lethal diseases of childhood are described, l the measure of achievement is recorded, country country, county by county, and town by town. t is satisfactory to learn the extent to which ive immunisation has already been adopted in s country. As one of the most tireless apostles the specific prevention of diphtheria, Dr. Graham rbes must have been gratified to observe the rease in the numbers of children protected since publication of his Special Report to the Medical search Council No. 115 in 1927. Active immunisa- n has now at least been commenced in a large mber of towns, great and small, in England and les. Scotland, and particularly Edinburgh, early lised the advantages of a child population immune diphtheria. France and America are well ahead us *in this matter* ; in those countries active immuni- ion against diphtheria has been adopted with mething more than tolerance and in some towns the United States even with enthusiasm. Though hick's test for immunity is acknowledged by all mpetent observers to be valid, its performance by no means essential as a preliminary step. The nission of the initial test merely results in the immunisation " of a few children already immune, d since the measures adopted are simple and can no harm, this does not matter. Indeed, since with the extension of the practice of immunisation some of the work must inevitably be carried out by practitioners with little experience of the test, the omission may be wise, and it has the further advantage of reducing the number of attendances of the mother and child. Active immunisation by the injection of one of the preparations described by Dr. Graham Forbes may be started at the first visit. The second injection follows, preferably, three weeks later, and the third and last a fortnight after that. A confirmatory Schick test is desirable when possible after attempted immunisation.

The preparations now used in this country are said to be devoid of risk. Reactions, whether local or general, are rare, and there is no negative phase. Toxoid (Glenny), the anatoxine of Ramon, is diphtheria toxin which has been digested with formaldehyde. The resulting product, whilst completely non-toxic, retains unimpaired its power of stimulating the production of antitoxin. Toxoid, with or without antitoxin, in soluble or in floccular form, has completely replaced, in Great Britain and France at least, the old toxin-antitoxin mixtures. Dr. Graham Forbes supplies ample evidence of the results of active immunisation against diphtheria. Whether it is applied to specially exposed adults, such as nurses in fever hospitals, or to children in orphanages or homes, school-children or children below school age, the reports are the same. Whenever the measure has been introduced upon a sufficient scale there has been a notable diminution in the incidence of diphtheria.

The task which Dr. Graham Forbes set himself was onerous. He has performed it with conspicuous ability and faithfulness and his work is an important addition to the literature of preventive medicine. The labour involved in the collection and analysis of the facts compels admiration. No public health department should fail to add this volume to its books of reference, and it is to be hoped that members of public health committees, if they do not purchase, will at least borrow it.

A Manual of Surgery.

By Alexander Miles, M.D., LL.D., F.R.C.S. Edin., Consulting Surgeon, Royal Infirmary, Edinburgh ; and D. P. D. Wilkie, F.R.C.S. Edin. and Eng., Professor of Surgery, University of Edinburgh. Vols. II. and III. London : Humphrey Milford, Oxford University Press. 1932. Pp. 685 and 578. 12*s*. 6*d*. each volume.

These two volumes complete the new Thomson and Miles surgery, now under the combined authorship of Mr. Miles and Prof. Wilkie. We have little to add to our review of the first volume. Seen as a whole, it is a very satisfactory work from many points of view. The authors are adepts at providing just the amount and kind of knowledge the average undergraduate wants. They have shown judgment both in the selections and rejections, and the presentation of material is singularly free from bias. The volumes are of convenient size, not too heavy to hold in the hand, and the print is easy to read, whilst the numerous illustrations must materially assist the student's understanding of surgery. A pass examination should have no terrors for a candidate who knows his Thomson and Miles, and he will have fractures of the body, and chip fractures. Pain might be caused by bony block due to displaced fragments. In a severe case the symptoms resembled those of a Pott's fracture; the hollows on either side of the tendo Achillis might be filled if there had been backward displacement. Some cases could only be diagnosed radiographically. The treatment was immobilisation in a plaster cast and rest for eight to ten weeks. If the head was displaced medially it must be manipulated into position before the plaster was applied. Reduction of a posteriorly-displaced fragment might need open operation. The function in unreduced cases was very bad. Fractures of the body were generally irregularly comminuted, and each case must be judged on its merits. If there was bony block the fragment must be removed. Any sub-astragaloid dislocation must be reduced. Amputation was necessary in open fractures where the astragalus was pulped. Operation was required in about half the cases, and there was in most cases some permanent disability of the ankle.

SEPARATED TIBIAL EPIPHYSIS AND CHRONIC ARTHRITIS.

Mr. E. P. **Brockman** described a new method of treating those cases in which growth of the tibia had ceased after separation of the epiphysis but growth of the fibula had continued, distorting the foot. He did an osteotomy of the tibia, plugging it with the growing end of the fibula, which he removed. Since growth in the tibia had ceased, there seemed no harm in stopping growth of the fibula, and the results had been satisfactory.

If a case of old Pott's fracture developed constant pain in the ankle, operation was indicated, and there was no reason for delay. Mr. Brockman advocated arthrodesis, and described his method for these cases, mentioning good results in 12 cases.

DISCUSSION.

The **President** described a survey he had made of ankle-joint fractures at the Ancoats Hospital in the decade 1920–30. The treatment had responded to the dictates of surgical fashion. In the first four years the handling had been *conservative: manipulation*, plaster fixation, and very late weight-bearing. The ultimate industrial results had been satisfactory. For the next three years the Delbet plaster had been used both as an ambulatory splint and as the primary method of fixation, early weight-bearing being encouraged. With earlier weight-bearing there had undoubtedly been earlier return to work. During the last two or three years the Delbet plaster had been given up on the grounds of expense, and Böhler's skin-tight complete plaster had been used, and the patient allowed to walk early, either on a stirrup or on a slab of plaster. The Delbet method could be very successful as a method of primary fixation. Prompt reduction could be *followed by perfect restoration*, and there was little tendency to redisplacement. Mr. Platt saw no place for primary open operation.

Mr. G. **Perkins** preferred *Ashurst's classification* of these fractures in ætiological groups: (1) External rotation, causing fracture of the internal malleolus and a spiral fracture of the lower end of the fibula, often with backward dislocation of the foot. This was easy to reduce and no disability followed. (2) Abduction, due to an abducting force on the foot, causing a high transverse fracture of the fibula, and breaking off the internal malleolus—rather difficult to reduce and very apt to recur. (3) Adduction—not very common, difficult to reduce, and often needing operation. (4) T-shaped into the joint, due to a vertical force passing up the leg. Each type required different treatment and offered a different prognosis.

Mr. N. L. **Capener** mentioned a late result of fracture of the astragalus: compression changes, *presumably due to interference* with the blood-supply, followed by sclerosis and compression.

Mr. **Dudley Buxton** thought that fracture of the lower end of the fibula with no displacement whatever was by far the commonest type. It required support for six or eight weeks. He suggested that ambulatory treatment had become popular at a time when every hospital was experiencing pressure on its beds. Immediate reduction was of the first importance, followed by fixation in an apparatus to keep the fracture reduced. The advantage of the stirrup, or a good thick plaster support, was that i enabled patients to walk without crutches. He kep plaster on for eight weeks in cases which had bee perfectly reduced, and a week or two longer if ther had been a slight error in reduction. Some fee would swell however they were treated; and Elastc *plast bandage was useful if swelling* persisted.

Mr. **Roberts** advocated the Delbet plaster for it simplicity, its allowance of early dorsiflexion and earl *ambulatory treatment without crutches*, its comfor its self-massaging action, and the absence of swellin It must, he said, fit the patient very accurately, bei moulded to the whole limb, including the mallec and the external peroneal nerve. There was le tendency to osteo-arthritis if the patient got abo early. A fracture was in a good position if t astragalo-tibial line was horizontal. The use of needle for local anæsthesia made a fracture compoun

Mr. **Naughton Dunn** said that reduction a prolonged fixation were the secret of the treatme of all fractures. He had never plated any fractu Most speakers had advocated too brief a period fixation. The result depended partly on the type patient; he agreed that arthrodesis offered the b course if pain persisted.

Mr. **Rowley Bristow** supported Ashurst's cla fication, and agreed that for the first type compl and early reduction was absolutely essential. long as the fracture was reduced, the subsequ treatment did not matter. Anæsthesia should alw be general. In the second type the difficulty reduction was nothing to the difficulty of keep the fracture reduced. This type required prolon fixation, followed by raising of the heels, an outs iron, and a T-strap. The difference between pr nosis and treatment in the two types illustrated value of the classification.

Mr. **Broomhead** replied.

Children's Ward at Beckenham Hospital. Sir George Sutton last week opened the children's w which, at a cost of £6000, he has presented to Beckenl Hospital. Instead of four cots in the adult wards t are now 12 cots and beds. The addition has been na the "Ruth Sutton Ward" in memory of the late L Sutton.

"Law Touts" in Hospitals.—The attent of hospital managers has been called by the Incorpor Law Society to the frequency with which "touts" certain solicitors visit accident patients in hospitals endeavour to persuade them to sue for damages. practice is to suggest that if the case is placed in hands of the "tout" he will do the work free of charg the event of failure, and will charge only two shilling the pound when damages are obtained. Should, howe the damages be substantial the solicitor's remuneratio likely to be much larger than the costs he could prop charge.

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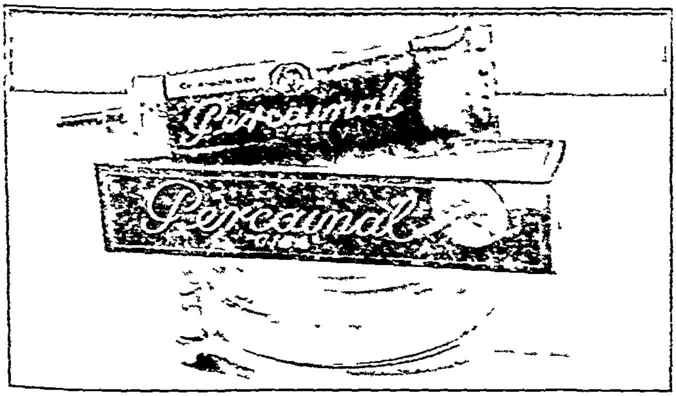

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gone very far towards reaching the standard required in the higher surgical diplomas and degrees. One small criticism suggests itself. Whilst the illustrations serve their purpose of demonstration fairly consistently, they nearly all seem to be half-tone blocks reproduced from photographs and are not nearly so attractive as the drawings which were common in the older editions. Moreover, some of the old illustrations seem to have been photographed and to have rather lost value in the reproduction. In all other respects the authors deserve congratulations on having completed their task of revision in an eminently satisfactory manner.

Die Dickdarmschleimhaut, Ihre Normale und Pathologische Funktion im Roentgenbilde.

By Priv.-Doz. Dr. WERNER KNOTHE, Head of the Radiological Department of the II. Medizinischen Universitats-Klinik der Charité, Berlin. Leipzig: Georg Thieme. 1932. Pp. 56. M.8.

THIS small volume on the changes in the mucous membrane picture of the large intestine follows closely on the work recently published by Albrecht on the mucous membrane of the stomach. Both are inspired by Hans Berg, who followed up the pioneer work of Forssell and brought it into every day use. Dr. Knothe has recorded here his observations on the mucous membrane of the large intestine. His study is beautifully illustrated by many radiograms of a high standard, which show clearly the different forms and varieties of mucous membrane as seen in relief picture. It is a good piece of work, but the author does not always convince us (except in regard to certain well-recognised conditions) that the appearances shown are necessarily produced by the pathological or disordered physiology to which they are ascribed—e.g., we do not know that it is "irritation" that produces certain changes in the relief picture. It is a moot point whether a pathologist would recognise "irritation" of the mucous membrane except when it is severe enough to cause some degree of inflammation. Opportunities for control are rare. The proof of cause and effect sometimes appears to be slender, especially when we consider the extraordinary variations of the normal that must be possible in such a mobile structure as the living mucous membrane. It seems possible that Dr. Knothe may have gone too far in the interpretation of his shadow pictures. In spite of the obvious difficulties, work of this kind should be pursued for a long time on subjects who may be presumed to be normal. It is only by the study of normal physiology that relatively slight changes in the relief picture of the mucous membrane can be interpreted correctly and deductions on disordered physiology made.

The get up and standard of reproduction of this book are very satisfactory, as in fact are all the radiological books that we have seen coming from this publishing house.

Abnormal Psychology.

By H. L. HOLLINGWORTH, Ph.D., Professor of Psychology, Barnard College, Columbia University. London: Methuen and Co., Ltd. 1931. Pp. 556. 15s.

Prof. Hollingworth has attempted, with a considerable measure of success, to cover the whole field of psychopathology from the study of feeblemindedness to drug addiction. She deals historically with the various theories of neurosis, and such neglected writers as Janet, Babinski, Hurst, Rosanoff, and Rivers are given due attention in addition to the more familiar Freud, Adler, and Jung. The volume is comprehensive and there are very few conditions and psychological theories which are not described and criticised. The most critical pages of all are devoted to the Freudian psychology; the fact that references to this school are directed against the "psycho-analogical viewpoint" will irritate many readers. It is obvious that the investigation of psycho-analysis which underlies the criticisms has been extremely superficial, with the result that Freud's concepts of unconscious symbolism and the use of dream analysis are regarded as mysticism and demonology. The very fact, as Prof. Hollingworth states, that psychoneurotic disorders have been cured by all forms of charlatanry and suggestion may invalidate every theory of explanation, but she appears to forget that psycho-analysis itself has not failed to give a reasonabl explanation of the mechanism of suggestion and th charlatan. The simple theories which she prefer to psycho-analysis are simple largely because she ha made them so, and has not subjected individua cases to prolonged investigation. The findings o psycho-analysis satisfy not only the problems o psychopathology to a high degree, but shed a ligh upon many human institutions. On this latte support of psycho-analysis she makes little commen No theory has finality, but up to date the Freudia hypotheses are based upon as prolonged and scientific an investigation of the facts as any oth theory, and seem to explain more of the facts.

Emigration, Migration, and Nomadism.

By the late WALTER HEAPE. Edited with preface by F. H. A. MARSHALL. Cambridg W. Heffer and Sons. 1931. Pp. 369. 12s. 6d.

A PLEASANT portrait of Heape forms the front piece of this characteristic book. He was origina an embryologist; students of Quain's Anatomy w remember his pictures of the early development the mole. But before he was 35 he had brok away from the conventional methods and became pioneer in the study of the physiology of generatio activating en route Dr. F. H. A. Marshall, who ed this book, which Heape left a little short of completi when he died in 1929. He deals with the journe of animals from which a return may be anticipat (migrations), their movements by which they p manently evacuate a territory (emigration) and th wanderings at random, and incidentally an ext ordinary range of germane and allied topics in whi any naturalist or student of human behaviour w be much interested; man himself is excluded fr the scheme. The background on which all t wealth of detail is arranged is sexual physiology a Heape's inductive belief in some kind of generati ferment which animals could apparently abso from their surroundings; we can imagine the delig with which he must have welcomed Evans and Bur discovery of vitamin E in 1925. We call the bo characteristic of Heape because it is gentle, huma and scholarly. It is also exceptionally interestin whether it deals with the bear's conception of ter tory, or with the migrations of Painted Ladies, tells how Stefansson sat over his seal hole in perf confidence that his daily bread must sooner or lat come up to take a breath of air.

THE LANCET.

LONDON: SATURDAY, MARCH 5, 1932.

YOUNG OFFENDERS.

In 1927 the Government of the time appointed Departmental Committee on the Treatment of oung Offenders. It was then recognised that ie reformation of the offender had become the ;ynote of the administration of justice, and that :oportionately greater stress should be placed pon the need for reformation of the young offender uring the years of mental plasticity. As the sult of their careful deliberations, the Committee me to certain definite conclusions of which ie following were some of the most important. rst, that the magistrates sitting in the juvenile urts should be specially qualified for the work, at there should be a pooling of their experiences, id that they should make themselves fully quainted with the institutions to which children e sent. Secondly, that the whole procedure of ch courts should be remodelled in the direction simplicity; that the court should be in possession full medical and scholastic reports, should work close coöperation with educational authorities, id should not be situated in premises used for her courts, and that these latter should be able refer a person under 17 to a juvenile court. hirdly, that much better facilities should obtain r the examination of young offenders, and that least three central remand homes should be tablished for this purpose, but wherever possible e fullest use should be made of bail. The ommittee also stressed the importance of probation the open rather than in institutions; the wider e of hostels was urged. No sentimental ideas wever were encouraged with regard to proation; supervision by women for girls, and men r boys was recommended. The Borstal system as praised, but it was urged that children should sent there for *training* and not "*sentenced to tention under penal discipline, &c.*" The age r capital punishment was recommended to be ised to 18. As regards mental defectives, the ave lack of accommodation was emphasised, nd the pathetic case of the post-encephalitic ffender was mentioned as calling for special eatment on purely medical lines. While these oints do not exhaust all the excellent recomendations made by the Departmental Committee ey do include all the points of interest to medical en who are or may be directly concerned with uch children as come before juvenile courts.

The Children and Young Persons Bill now efore the House of Commons is substantially ased upon the recommendations of the Committee f 1927.

In future the court shall not be associated with the remises of a police station or adult court, and the magistrates are to be chosen from a panel of those specially qualified to deal with juvenile cases.

The age of young offenders or those needing specially guardianship who appear before a juvenile court will be raised to 17.

In the place of the two categories of schools (industrial and reformatory) there shall in future be one class (approved schools), to which children are to be sent for a period of three years, but if under 11 years of age they may be detained until the school-leaving years.

The age of capital punishment is to be raised to 18, and the adult courts are to have the power to remit juvenile offenders to the juvenile court.

But while the Bill illustrates the fact that time has worked a change towards the appreciation of the special needs of young offenders, it has singularly failed to take into account the medical, psychological, and sociological advances that have been made in the field of juvenile delinquency. Pædiatricians, psychiatrists, and social workers who are in daily contact with the neurotic and behaviour disorders of children and of young adolescents, are witness to the multiple factors that go to make up the mentality of the so-called difficult child. They are aware that while society must expect of its members a reasonably high degree of conformity to social usages, it is impossible to apply to young people the same legal categories as are applied to adults. Moreover, during the years of mental plasticity, before social sentiments are established, the child as a labile organism is only too easily influenced by medical conditions, sometimes gross, sometimes subtle, and by environmental factors. Above all, there are individual reactions to family stresses born of temperamental peculiarities which have to be carefully assessed before remedial measures can be applied. Delinquency as much as neurosis is a function of the personality in its interplay with environmental forces. Only expert study of this interplay can reach an understanding of the forces at work and apply a suitable remedy. In Belgium, the Government has established at Moll an institution which is nothing less than a research station; to this young offenders are sent and here their problems are studied by an expert staff before they are sent to places of detention according to the character of the disorder from which the child and adolescent is presumed to be suffering. There is unhappily no indication in the present Bill that any consideration has been given to the all-important subject of diagnosis upon which adequate treatment shall be based. In some of our juvenile courts, the presiding magistrates have invited the coöperation of psychiatrists who have experience in child psychology from their practice in the child guidance clinics and analogous treatment centres. Their value has been proved in many cases. They have sometimes in a side room of the court—or more often in their clinics when cases have been put on bail or probation—disclosed medical and psychological factors which explain the offence. They have discovered family conflicts and environmental stresses from which the child in his dilemma has escaped along the path of delinquency. In addition they have been able to give valuable guidance to probation officers

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ears and their scale might easily become larger. he cost in death and disability has not yet been ery great, but it should be generally realised at a high proportion of our endemic cases are f the epidemic (acute febrile) character, and thereore susceptible of preparalytic diagnosis and eatment. The means should be ready to hand

USE OF TUBERCULIN IN DIAGNOSIS.

Nearly forty-two years have passed since och introduced the substance now universally nown as "old tuberculin." It failed to live up expectations as a specific cure for tuberculosis, nd seven years later Koch himself abandoned it n favour of "new tuberculin." From that time nwards the ingenuity of the immunologist has eadily added to the number of tuberculins ntil confusion has become worse confounded. ut whatever may be the verdict of posterity n their value as remedies, it seems pretty clear at Koch's old tuberculin is useful in diagnosis. f the tuberculin tests used in clinical practice the ne introduced by Pirquet in 1907 was *facile rinceps* until after the war. It has passed through any vicissitudes of obloquy and praise and, lthough leading exponents of tuberculin diagnosis, ch as Hamburger, have demonstrated its llacies, it is still extensively used in many lands, ough not very largely in this country. In 908, Mendel and Mantoux independently introuced the intradermal test, which, though dmittedly more precise, failed to attract much ttention until after the war. Since then it as come to its own as the most reliable and ccurate of the tuberculin tests, largely as a result f extensive records compiled in America. In valuable report issued last week, Dr. P. D'Arcy art[1] has explored much of the new work and ondensed it—a very considerable achievement—nd also records a tuberculin survey of London hildren which may be compared with those recently ublished by W. F. Gaisford from the East ondon Hospital for Children and by D. J. Dow and E. Lloyd from the Brompton Chest Hospital. glance even at Dr. Hart's bibliography leaves feeling almost of dismay in the minds of those amiliar with the solid, red-paper-covered volume f Bandelier and Roepke which was the great tand-by of the early days.

With some of the issues raised by these modern evelopments we have already dealt.[2] Three t least may be underlined as important: 1) the relative value of the various fractions of rude tuberculin which have been isolated during he last few years; (2) the records of the tuberulin surveys as evidence of the prevalence of uberculosis in both large crowded communities nd in small isolated units; and (3) the sociological significance, from the standpoint of the mmunised community, of the negative reaction, specially as regards the "contacts." To these, Dr. Hart would presumably add a fourth, for he asks the reader to reconsider the tuberculin skin reaction as a means of clinical diagnosis in relation to the new Mantoux test. The first question is of a highly technical character, and must be left to the immunologists and biochemists to work out, but light is thrown upon it by Dr. Hart's observations[3] on the incidence of skin sensitiveness to glycerinated veal peptone broth (the medium used in preparing old tuberculin) and its relation to tuberculin sensitiveness. Of the second question more needs to be said. In surveys of whole communities, especially of school-children, the intradermal test has been used to amass vast columns of statistics. It was necessary that it should be done for each country, but we confess to the hope that the spate of uninspired arithmetic will soon diminish, for we doubt if a few odd thousand more children added to the tally will help matters much. Probably most clinicians of experience will agree with the view that a positive tuberculin reaction means that the person has at some time been affected with the tubercle bacillus, but, as Dr. Hart admits, no more stringent conclusions can be drawn than this. Comparing some of the earliest tuberculin surveys with the more recent he says that in the former surveys there seemed to be an assumption that among the poorer classes of some European and American cities there was a very high proportion of tuberculin positives in late childhood, whereas recent figures with the intradermal test show considerably lower percentages. Is this due to differences in technique, or is it due to an actual reduction in incidence of tuberculous infection in childhood? He also suggests that these systematic tuberculin tests on children may throw light on a new clinical entity—transient and benign illness accompanying tuberculous first infection.

As a means of investigating contacts the test has been abundantly justified by the data produced. Some of the figures are astonishing. In Oslo, for instance, J. Heimbeck[4] tested with the Pirquet reaction probationer nurses of the ages 20 to 25 entering the Ullevaal Hospital, part of which consists of beds for tuberculous patients. Of 282 nurses who began with a positive Pirquet reaction four developed tuberculosis, whilst of 299 who began their training with a negative reaction 67 became tuberculous. Some confirmation of these figures is given by E. K. Geer[5] from hospitals in the State of Minnesota where the incidence of tuberculous infection in young adults seems to be low. Since September, 1928, he has tested all incoming probationers at the Ancker Hospital in the city of St. Paul, Minnesota, 215 out of the 975 beds in the hospital being allotted to tuberculous patients. Thirty per cent. of these nurses showed positive reactions to the intradermal test on entering the training school, and practically all gave a positive before they had completed their three-year training period. The records of these nurses indicate that the negative in charge of cases, and have saved curable cases from years of confinement in reformatories and industrial schools where no classification can be made, or rarely is made, and where the treatment must be more or less standardised.

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[1] The Value of Tuberculin Tests in Man. By P. D'Arcy Hart, .D., M.R.C.P., Med. Research Council Spec. Rep. Series No. 164. London: H.M. Stationery Office. 1932. Pp. 136. 2s.

[2] The Lancet, 1931, i., 872.

[3] Quart. Jour. Med., January, 1932, p. 49.

[4] Norsk. Mag. f. Laegevidensk., 1929, xc., 18. (Abstr. in Tubercle, 1931, xii., 327.)

[5] Arch. Int. Med., 1932, xlix., 77.

The outstanding omissions from the Bill are therefore, first, the need for observation centres in the place of the present remand homes, at which centres diagnosis of the condition can be made after expert social and psychological data have been collected. Secondly, the need of the presence in an official capacity in juvenile courts of trained psychiatrists to aid the magistrate in disposing of cases after the charge has been substantiated. Lastly, no provision is made in the Bill for the establishment of an adequate service of probation officers trained in the ground-work of family psychology and social conditions and possessing the type of personality which is only too rare in this type of work. Many who do this work in connexion with various voluntary bodies are poorly paid and succeed largely because of their enthusiasm for work of deep social importance. Those in authority must surely recognise that the progress of modern pædiatrics and psychology is not the work of yesterday, but is the result of the accumulated knowledge of the last 50 years. The philanthropic zeal of the prison reformers has been richly supplemented by a growing body of knowledge with regard to the motives of disorders of conduct. The foundations of personality are laid in childhood, and to correct the disorders of personality in the early years of childhood or at least in adolescence is to lay the foundations of good citizenship and so to relieve the courts of adult cases who return again and again because early measures have not been adopted to deal with social evils at the root.

THE DIAGNOSIS AND TREATMENT OF POLIOMYELITIS.

Poliomyelitis does not present quite the same problem in England as it does in Australia, but no one can afford to ignore the lessons of the Melbourne epidemic. Dr. Jean Macnamara and Dr. F. G. Morgan conclude their account of it in our present issue, and their paper defines very clearly our responsibilities towards victims of this disease. The story is highly encouraging, but Melbourne has evidently set a standard to which we cannot attain without a definite effort. In Australia the reward of such effort has been very great.

The practitioner will find the report interesting, first because it brings out clearly the possibility of diagnosis before the stage of paralysis and describes in detail the means by which this early diagnosis can be made. Attention is directed towards the signs and symptoms of the prodromal feverish attack and especially to the "spine sign" which signifies impending paralysis. Lumbar puncture, it is emphasised, must be undertaken only if the warning indications of cerebro-spinal involvement are present. Premature disturbance of a sick and feverish child is well avoided. but it is not discomfort only that is to be feared. For lumbar puncture, done in a genuine case of poliomyelitis before the meningeal irritation has provoked the characteristic reaction, will be misleading and may also upset the delicate relations between the cerebro-spinal fluid and the pia-arachnoid and thus favour spinal infection. That lumbar puncture tends to increase the permeability of this last line of defence is insufficiently appreciated; *indeed, early puncture is often ardently* advised. Evidently this is to be deprecated; on the other hand it cannot be too strongly emphasised *that lumbar puncture in a suspected* case of poliomyelitis is urgently required as soon as there are signs of the central nervous system being involved. Dr. Macnamara is also emphatic that the examination of the fluid should be done there and then, at the bedside, and that immune convalescent serum should be injected without removal of the needle if the diagnosis is positive. Delay in giving serum may be very serious or disastrous. But if the supply of serum is unavoidably delayed it seems to be better to await its arrival, and then do the lumbar puncture, rather than prove the diagnosis by lumbar puncture and *then* wait for the serum. The serum itself must be free from any toxic or irritating substance, so that neither a general febrile reaction, nor a local spinal or meningeal irritation, may disturb the clinical picture. The result of an adequate dose should be a prompt and progressive fall of temperature and clinical improvement; unless this takes place a further dose must be given promptly, and the decision is not at all easy to make if the serum has properties beyond its immunising effect. Macnamara and Morgan therefore prefer human to horse serum, and they use serum prepared and preserved with the utmost precaution but without antiseptics. Obtained from old cases, it is pooled and tested from time to time against virus. Its therapeutic powers are almost magical. On the system which Dr. Macnamara adopts, the aggregate paralysis of each case can be expressed in figures and the contrast between treated and untreated cases is astonishing. The records are all the more convincing in that the majority of serum cases show a paralysis aggregate numeral, though a very small one, indicating that the virus succeeded in reaching the anterior horn cells and that they were true, not abortive, cases of poliomyelitis.

England seems to have been the first European country to harbour the disease (1784, Underwood) which was said to be of Asiatic origin. It was not recognised until 1840 on the continent (Heine) and until 1841 in America (Medin). We had indeed a start, but probably a short one, and this is of interest because some hold that we have become relatively immune as a race and therefore need not fear the serious epidemics from which other countries suffer. Whether the prolonged endemic persistence of poliomyelitis *has given some* degree of immunity, or the cool climate is in our favour, we do not know, but it would be easy to have an undue sense of security. There have been various small epidemics in this country in the last five ncome of all hospitals. With the increase of contributory schemes and paying wards these contributions may tend to disappear. The crux of the whole position is found in the disposal of funds made available to hospitals through contributory schemes, the term being used in its widest sense, and the committee asks two pertinent questions:

> (a) Are members of existing contributory schemes paying at this time enough to meet the cost of their maintenance while in hospital and to provide a contribution towards the remuneration of the visiting medical staff?
>
> (b) Is it practicable at this moment of unexampled financial stringency and unemployment to suggest a higher rate of contribution?

Conditions are not uniform throughout the country, experiments are still being made by individual hospitals, and a natural process of growth and adjustment is in evidence. The committee thinks it would be an error to attempt to drive the more backward regions to seek to hold back the more progressive, or to insist upon absolute uniformity between hospital and hospital. Apart from this there is general agreement on the payment to the visiting medical staff of a part of funds paid on account of in-patients and out-patients by the State, county or municipal or other public authorities, or by accident insurance companies.

The joint committee registers its conclusions: (1) that the time has come to recognise the claim of the visiting medical staffs to some share in the moneys raised for the treatment of patients in hospital, other than those provided by voluntary subscription or donation for the treatment of free patients; (2) that the ideal contributory scheme is one in which the individual shall contribute upon a basis designed to provide (a) cost of maintenance, (b) something towards the remuneration of the visiting medical staff; (3) the provision in all suitable hospitals of a sufficient number of rooms or wards for paying patients, coupled with the strict application of a maximum means test for entry into general wards.

THE GERMICIDAL POWER OF THE SKIN.

Two years ago L. Arnold and co-workers[1] came to the conclusion that the skin has some power to destroy bacteria. In further experiments on the same subject J. F. Norton and M. N. Novy[2] have closely followed the technique they described. The hands were immersed in a dilute suspension of *Bacillus prodigiosus*, and from the surface thus infected agar plates and broth tubes were inoculated after various periods. The colonies which grew were counted, and the results were carefully recorded. As might have been expected, the factors of moisture or dryness had a big influence. During the experiments it was found that the skin usually became dry in ten minutes, and whereas, in a series of 12 experiments on the dorsal surface of the hand, there were apparently no organisms left after half an hour, as many as 150 to 1000 colonies could be counted when the skin was kept moist by water vapour. Other materials, such as glass, filter-paper, and tanned hide were tested in the same way and found to give closely similar results, from which it is concluded "that these experiments fail to indicate any inherent germicidal power of living skin." Apart from their surgical and hygienic bearings these results are of dermatological interest. If moisture favours the growth of bacteria—and of this there is, of course, no doubt—it is easy to understand the part it plays in producing such conditions as washerwoman's dermatitis, tinea cruris and pedis, and the various forms of intertrigo, whether due to bacteria or fungi. This knowledge supports experimentally the value of desiccating or exsiccating remedies like spirit, powder-containing lotions, and absorbent powders. Equally significant are the evil results of too much moisture, and the occlusory effects of grease and ointments in the intertriginous type of case.

EUTHANASIA.

LAST October we reported[1] Dr. C. Killick Millard's presidential address to the Society of Medical Officers of Health, in which he pleaded for the legalisation of euthanasia. He has now reprinted his paper in pamphlet form,[2] together with the text of his proposed Bill and an appendix containing expressions of opinion by doctors, clergymen, and others. Sir W. Arbuthnot Lane, in a foreword, strongly supports Dr. Millard's views, and says he has met with widespread approval of them in the audiences, chiefly composed of working people, whom he has addressed. He points out, however, that it will probably be difficult to pass the Bill rapidly through the House of Commons, and the *Spectator* in an editorial article last autumn probably came even nearer the truth when it said that the Bill stood not the smallest chance of passage into law at present. Nevertheless, the drafting of a serious Bill is a good method of stimulating public discussion in a subject as important as this. Dr. Millard produces a considerable number of thoughtful opinions in favour of the legalisation of euthanasia subject to adequate safeguard, but only gives, as an example of adverse criticism, four extracts which on the face of them would not be likely to command much respect from reasonable minds. Surely a movement as novel and daring as this has evoked as weighty criticism as it has approbation? If Dr. Millard has received any expressions of adverse opinion at all comparable with the favourable ones he quotes, it would probably help his cause if he were to publish them.

THE TOURNIQUET.

IN the last issue of the *British Red Cross Quarterly Review* there is a tale with a moral to it. A woman had been knocked down by a bicycle in the street, and had a nasty cut a little above the left eye. An errand boy, who had secured a front-row position, asked anxiously: "Aren't you going to stop it with a tourniquet?" Most first-aid manuals take the tourniquet for granted, and give first-aid workers a vague and diplomatic warning about the dangers of too prolonged pressure without, as a rule, mentioning any time limit. Few, if any, authors of such manuals ignore the tourniquet altogether or to refer to it as a disreputable relic of the past, whose only habitat should be the museum. This is, however, the gist of the opinion expressed by Dr. M. Stassen in *Bruxelles-Médical* for Dec. 13th, 1931. During the past seven years he has dispensed with the tourniquet in the first-aid equipments for which he has been responsible, and among the several hundred cases of compound fractures of the limbs brought to his hospital from points up to 60 kilometres distant, he has not once had a death from hæmorrhage during transport. Belgian army surgeons formed a very bad opinion of the tourniquet during the Great War, and Dr. Stassen regards this instrument as a frequent reactors at the end of the childhood period are virgin soil for adolescent infection. The investigation of R. J. Matthews in Wales points in the same direction, though unfortunately, like Heimbeck's figures quoted above, his records were obtained with the old Pirquet test and are therefore not strictly comparable with Geer's. Following up a number of child contacts over a period of years Matthews found that in a group of 120 cases there was no tuberculosis in the tuberculin positive group, whereas in the negative group there were seven cases which subsequently developed tuberculosis, six of them on reaching adolescence. There is good evidence therefore that non-reactors cannot merely be dismissed with the verdict "all is well." Their chance of subsequently developing clinical tuberculosis is greater than that of the reactors. With regard to tuberculin as an aid to clinical diagnosis Dr. Hart states that a positive response in infancy more than at any other age suggests a tuberculous infection which is likely to be progressive, and that clinical tuberculosis is, or soon will be, present, and moreover that the outlook is unfavourable. A positive reaction in children aged 2 to 5 *with symptoms* is also of significance, but, in Dr. Hart's opinion, the interpretation of the positive reaction in those over five years of age requires considerable experience and at the present stage defies dogmatism. We are not sure, however, that we should like to go all the way with him in saying that the diagnosis of *tuberculosis in childhood* should never be made without performing a tuberculin test unless there is clear bacteriological or pathological evidence of disease. These positive reactions, too, like the positive Wassermann, may prove actually a red herring. Dr. Hart makes a valuable point when he states that in certain cutaneous conditions, such as lupus pernio and the sarcoids, a loss of tuberculin reactivity may be found, so that a positive response is evidence against the diagnosis, whilst a negative response, demonstrated by the intradermal test in maximal doses, strongly supports the diagnosis.

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[1] Amer. Jour. Hyg., 1930, xi., 345.

[2] Amer. Jour. Pub. Health, 1931, xxi., 1117.

[1] THE LANCET, 1931, ii., 905.

[2] Euthanasia: a Plea for the Legalisation of Voluntary Euthanasia under Certain Conditions. By C. Killick Millard, M.D., D.Sc. London: C. W. Daniel Company. Pp. 44. 2s.

Although Dr. Hart is both wisely conservative and scrupulously careful to avoid extravagant claims he has shown that much remains to b done. Tuberculin diagnosis is not the close chapter it was thought to be even a decade ago The next advance seems likely to be along laborator lines. During the last few years important step have been taken in standardisation, and quit recently a team investigation has been starte in America which has already made importan contributions in the fractional investigation tuberculin products.

ANNOTATIONS

HOSPITAL STAFF PAYMENT.

The question of paying the visiting medical staffs of voluntary hospitals has been advanced a stage by the issue of a report[1] by a joint committee of the British Hospitals Association and the British Medical Association. Institutional treatment, it is remarked, has largely displaced treatment in the home, and is tending to do so more completely. At the same time social status and private means are counting less as reasons why any patient should or should not go to hospital. This substitution of institutional for home treatment has restricted the private practice of consultants and specialists, who find it increasingly difficult to earn a living without raising their private fees. The narrowing of this field of private practice shows signs of bringing about a reduction in the numbers of consultants and specialists who are in a position to give gratuitous service to the voluntary hospitals—a tendency regarded as likely to increase. The effect of competition with the municipal hospitals is then considered.

Under the Local Government Act, 1929, local authorities may finance hospitals not only for patients of the poor-law category, but for the whole community. Such council hospitals might be staffed by part-time consultants as well as whole-time medical officers, both on a salaried basis. Their management might be in the hands of representative committees, and they might be associated with teaching schools. They might thus closely approximate to the voluntary hospitals while enjoying the powerful advantage of drawing their financial support from public funds. Again, such council hospitals may, in accordance with the terms of the Act of 1929, receive subventions from contributory schemes on account of treatment given to contributors. In the case of patients able but unwilling to pay for their treatment, council hospitals may recover payme by legal process. The constantly extending demand f institutional treatment, coupled with the shortage (in mo areas) of hospital accommodation, makes it, in our opinio very probable that local authorities will in the course time contemplate ambitious schemes for the provision beds for other than p [illegible] But whether not this proves to be t [illegible] to believe th the existence of public [illegible] ith paid who and part-time visiting medical staffs will not have a power influence in the direction of strengthening the demand f payment by the visiting medical staffs of volunta hospitals.

The problem accordingly resolves itself into t devising of means whereby all voluntary hospit patients who can afford to do so may make a reaso able contribution towards the fees of the docto who treat them as well as towards their maintenan while in hospital. The case of paying patien presents little difficulty, for it is self-evident that patient whose means enable him to pay for treatme as a private person should be allowed to enter t general wards of a hospital. The provision in suitable hospitals of a sufficient number of rooms wards for paying patients, coupled with the stri application of a maximum means test for entry in general wards would, it is felt, have an importa bearing upon the position and attitude of the visiti medical staffs. To what extent *such provision* already available in the London area may be se from a list of pay beds, revised up to the end 1931, and just issued[2] by King Edward's Fund. T joint committee commends the *matter* to the attenti of hospitals in which such accommodation is capab of extension or has not yet been introduced. Co tributions obtained directly from patients throu the efforts of almoners during or after treatment a said to constitute about 10 per cent. of the aggrega an experiment in the prevention of the common ld by means of a vaccine. In the experimental oup were 80 medical students, and in the control oup were 82. He concludes that the statistical sults of the experiment show little, if any, advantage to the experimental group. The mean number f colds suffered by the experimental group (over ven months) was 1·85, with a mean duration of ·4 days, while the corresponding figures for the ontrol group were 2·17 and 7·6. These figures do ot differ significantly, but on the other hand the stimated average duration of colds during the preious years amongst the experimental group was 0·5 days, while the same average for the control roup was 7·6 days. This suggests that some improvenent may have taken place amongst the experinental group, but it also points to the weakness of he investigation. Any method of investigation that llows the experimental group to be unduly weighted vith "susceptibles," as is here apparent, must be nsatisfactory. To prove that the groups are comparable with regard to such factors as the amount f water (and/or alcohol), tobacco, chewing-gum, and ice-cream they consume, the time when they go to bed, and the number of baths they take weekly (to mention but a few for which this paper provides statistics), seems an idle refinement in the face of such a fundamental difference with regard to susceptibility as is suggested by the previous histories of colds.

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[1] The report is signed by Lord Linlithgow (chairman); on behalf of the British Hospitals Association by Sir Arthur Stanley, Sir Harold Pink, Sir Ernest Morris, Mr. R. H. P. Orde, and Mr. Gerard T. Whiteley; on behalf of the British Medical Association by Sir Robert Bolam, Sir Richard Luce, Mr. Bishop Harman, and Dr. Alfred Cox.

[2] Geo. Barber and Son, Ltd., Furnival-street, London, E.C January, 1932. *3d.*, post free.

ACCIDENTS AND HOSPITAL CONTRIBUTORY SCHEMES.

MOST of the annual reports and meetings of the provincial hospitals which come thick and fast at this season are concerned with the burden placed upon them by road accidents. In a recent broadcast speech Lord Moynihan stated that Leeds Infirmary is losing £2000 a year in this way; Bradford Infirmary last year spent £600 more than it recovered upon such cases; Southport Infirmary lost £373; the Devon and Exeter Hospital complains that the suggested uniform charge of seven and sixpence a day for the treatment of victims of road accidents is "totally insufficient." In every part of the country the story is similar, and in some places contributory schemes are becoming inadequate to meet the swollen expenses, in which motor accidents are one of the items. Birmingham has already raised its contribution; Sheffield is thinking of doing likewise; and the Merseyside Hospitals Council is seeking to widen its scheme by, among other means, appealing for those annual subscribers who in most places show a tendency to fall away. Just now Liverpool is having a rather unhappy experience. Last year its port sanitary and hospitals committee spent nearly £37,000 in excess of the estimates, almost the whole of which was attributable to capital expenditure upon transferred institutions to bring them into line with the modern type of hospital. Meanwhile Liverpool, undaunted, is hastening the completion of its new Samaritan Hospital for Women which is to cost about £150,000.

Contributory schemes, under various names, are becoming increasingly important to every hospital fed by them, and several new ones are being launched. An outstanding example of success is the Leeds Hospital Fund which last year increased its income by £10,500; it now exceeds £56,000. In ten years the workpeople's hospital committee of Gloucestershire Royal Infirmary has raised just under £100,000; last year the Torbay Hospital contributory scheme collected over £7000; in 1931 the Exmouth and District Hospital League increased its membership by 1537; the Newton Abbot contributory scheme, with over 5000 members, brought in £1500. In view of these and similar figures there is small wonder that other hospitals of varying degrees of importance have decided to establish contributory schemes. Thus Walsall General Hospital, the scene in its early cottage hospital days of the devoted labours of "Sister Dora," sees no other way of making necessary enlargements, and it is proposed to make a reciprocal arrangement for treatment of its members with the neighbouring Wolverhampton Royal Hospital which has recently established a highly successful scheme with a large basis of miners. Simultaneously Goole is considering a scheme that would enable its Bartholomew Hospital, in return for a contribution of twopence a week, to give free treatment to persons whose weekly income is under £5, with special arrangements for the neighbouring villages. Since Wolverhampton has 210 beds, Walsall 100, and Goole 24, the advantages of a contributory scheme are seen to appeal to hospitals of very varying dimensions.

DISTRICT NURSING IN LONDON.

IN her survey of district nursing in London, published by the London County Council last year, Dr. Margaret Hogarth paid a remarkable tribute to the thoroughness with which care of the sick poor in their homes is organised. "I was impressed," she wrote, "with the tremendous amount of individual and collective voluntary effort expended in securing for the poorer classes a free nursing service of the highest quality obtainable. This service is never denied to anyone who cannot pay for the services of a private nurse. . . . The qualifications of the nurses employed are the best obtainable in the nursing profession." Much of the responsibility for coördinating the work of the different bodies engaged in domiciliary nursing falls upon the Central Council for District Nursing, a voluntary organisation founded for this purpose in 1914. Nursing care for the sick poor of London in their homes is provided in three ways: by district nursing associations, either independent or affiliated to the Queen's Institute; by nurses attached to the nursing branch of the Ranyard Mission; and by a few parish nurses. It speaks highly for the work of the Central Council that Dr. Hogarth found only one part of London—the new Grove Park Estate—uncovered by the organisations now at work; and even there steps were being taken to provide a nurse. The changes in administration following the enforcement of the Local Government Act of 1929 could not fail to affect the position of the Central Council to some extent, and at the end of 1929 a deputation was sent before the London County Council to explain the Central Council's work and to offer their experience and machinery for the distribution of any future subsidy which might be made to district nursing in place of the inadequate and unequal grants previously given by the boards of guardians. The annual report of the Central Council for the year 1931 tells us that a committee was formed by the London County Council to consider the question of grants, but that no definite conclusion has so far been reached. The decision can hardly fail to be one of grave importance to district nursing organisations, since the economic crisis makes it increasingly difficult for them to obtain financial assistance. It is significant of their position that the City Parochial Foundation in making cause of traumatic shock and gas gangrene. By completely arresting the circulation in the injured limb, the tourniquet promotes infection in the crushed and torn tissues, and its removal is followed by absorption of toxic products capable of killing a patient already weakened by cold, shock, and loss of blood. At The Hague in 1931, during the sixth International Congress of Military Medicine and Pharmacy, various speakers condemned the tourniquet in unequivocal terms. Colonel Praag on this occasion declared that the medical personnel cannot be taught too much about the dangers of the application of the tourniquet which should not be permitted in any but cases of extreme urgency. In his report on the "Action du garrot sur le choc traumatique" Colonel Dante Casella was not less emphatic on the same occasion. The errand boy, it would seem, is now the staunchest friend of the tourniquet.

NEW NAMES FOR HOSPITALS.

ASCENDING for once from the practical to the romantic, the London County Council decided to improve the names of some of its hospitals by abandoning the territorial and utilitarian in favour of something more aspiring. It has, however, chosen the new designations with a nice regard for local susceptibilities which, even in London, are properly tender. Resisting the temptation to call its hospitals after their chairman or vice-chairman, it has entered the safer field of hagiology. St. Leonard of Shoreditch, St. Alphege of Greenwich, and St. Olave of Bermondsey are names which belong to local history. The comparatively unfamiliar St. Benedict will illuminate the hospital at Tooting which will thus be able to realise a spiritual relationship with the St. Benet to whom the City of London dedicated four of its ancient churches. The Hospital of St. Nicholas, beloved of fishermen, carries on the traditions of Plumstead: but St. Charles of Marylebone seems to be more picturesque than locally appropriate. Only two saints of that name appear to be known to the Churches—the Roman St. Charles Borromeo and the "Charles, King and Martyr" of the old Anglican calendar, to whom some five or six churches have been dedicated. That houses of healing should be given distinctive names suggestive of the spiritual basis of hospital work is all to the good. But it rests with the staff of these institutions to make the new designations so familiar that we shall speak, for instance, of St. Olave's without the need to mention Bermondsey.

RELIEF OF VESICAL IRRITATION.

As a remedy for painful conditions of the bladder, B. E. Greenberg and M. L. Brodny[1] have been using mineral oil sterilised in the autoclave, cooled and then heated to body temperature. Some 4 oz. of the oil are injected slowly into the bladder, and despite the fact that patients with cystitis suffer from increased frequency—partly because of their condition and partly because they are on "forced fluids"—some of it may remain there as long as a week. After its instillation the vesical irritation, tenesmus, and frequency are reduced; as the burning decreases the patient loses his fear of micturition and consents to drink the large amount of liquid required for adequate therapy. Greenberg and Brodny have used this method not only for ordinary cystitis, but also for tuberculosis of the bladder. They have, moreover, found it useful in alkaline cystitis where the bladder wall is encrusted with phosphates; the oil loosens the encrustations and cleans up the bladder. In a previous paper[2] Greenberg has advocated the use of sterile mineral oil as a medium for cystoscopy, finding that with irritated bladders far better distension could be obtained with oil than with boric lotion. Furthermore, the intense discomfort which often follows cystoscopy in such cases was prevented. Finally, the oil was found to encourage hæmostasis so that cystoscopy could be undertaken in the presence of bleeding that would otherwise have obscured the view. The method is a simple one, and these claims are so striking that it certainly deserves a trial.

PROBLEMS OF RESPIRATORY DISEASE.

RECENTLY we quoted observations on draughts and colds published by Winslow and Greenburg in the January number of the *American Journal of Hygiene*. The same issue contains several other papers on various aspects of respiratory disease. Janet M. Bourn reports a further study of the occurrence of *Hæmophilus influenzæ* (Pfeiffer's bacillus) in Baltimore, based upon 2600 nasopharyngeal cultures. The bacillus was isolated with no greater frequency from cases of respiratory disease than from healthy persons. In addition, during 1928–1929 a widespread epidemic of influenza took place. The incidence of *H. influenzæ* was no higher in these epidemic months than in the following non-epidemic year, a result in agreement with the conclusions of the report published by the Ministry of Health in 1930 on the nasopharyngeal flora of a group of the Manchester population.[3] On the other hand, in the English study there was no evidence that the onset of a cold was associated with any characteristic change in the nasopharyngeal flora. In Bourn's investigation a more detailed study of cases of upper respiratory disease (which included influenza and other symptoms besides the common cold) showed a higher frequency of the bacillus amongst those with more extensive local symptoms. For example, the bacillus was found in 28 per cent. of cases with cough and in only 16 per cent. of cases without cough, a difference which is unlikely to have arisen by chance. This difference and a tendency to a greater frequency late in the attack in all cases support the general belief that this particular bacillus is of importance as a secondary invader. Frequent examinations showed that practically all persons of the classes studied harboured *H. influenzæ* at some time during the two years.

With regard to the pneumococcus, Selma M. Shultz found the duration of the carrier state amongst 35 children convalescent from pneumonia to vary between 2 and 152 days. She considers that the convalescing child, possibly carrying the pathogen in its throat for such long periods, may well be considered a potential source of respiratory diseases in others. For 21 children with pneumococcal pneumonia she endeavoured to measure the incidence of pneumococcus carriers amongst contacts. Naturally the search had to be limited to the most intimate contacts, and amongst these (86 in number) 13 per cent. produced the same type of pneumococcus as that isolated from the pneumonia patient. No significant variation was apparent in the virulence of the bacillus isolated from the cases and the corresponding carriers.

In a third paper W. E. Brown gives the results

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[1] New Eng. Jour. Med., Jan. 21st, p. 114.

[2] Ibid., 1931, ccv., 1366.

[3] Min. of Health Rep. on Pub. Health and Med. Subjects, No. 58. London, 1930. See THE LANCET, 1930, ii., 262.

SPECIAL ARTICLES

POLIOMYELO-ENCEPHALITIS
IN VICTORIA (1925–1931).
TREATMENT BY HUMAN IMMUNE SERUM.

By Jean Macnamara, M.D. Melb.,

HON. MEDICAL OFFICER TO THE PHYSIOTHERAPY DEPARTMENT, CHILDREN'S HOSPITAL, MELBOURNE; CONSULTANT TO THE VICTORIAN COMMITTEE FOR POLIOMYELITIS, APRIL, 1925, TO AUGUST, 1931;

AND

F. G. Morgan, M.B. Melb.,

DIRECTOR, LABORATORIES DIVISION, COMMONWEALTH DEPARTMENT OF HEALTH, AUSTRALIA.

(Concluded from p. 472.)

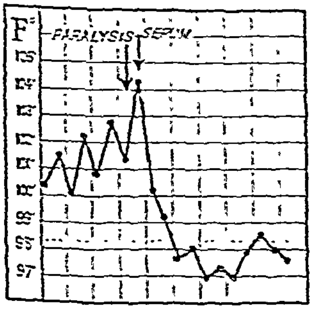
Results of Serum Therapy.

During the period under review serum has been administered to 260 patients. When a patient has sought treatment within 24 hours of the advent of paralysis, if *fever persisted an intravenous injection* of 40–60 c.cm. of serum has been given. The usual but not invariable sequence has been an immediate fall of temperature and arrest of paralysis at the stage existing when the injection was made (Fig 4).

During the months November, 1930, to July, 1931, an epidemic of 270 cases occurred. This excited great public interest. In Melbourne, where most of the cases were, families are not large: children are valuable. The press, authorities of schools, kindergartens, infant welfare centres and similar organisations, united in impressing upon parents the necessity for early diagnosis. Hundreds of children, on the slightest evidence of malaise, were taken to their doctors or to the out-patient departments of public hospitals because the parents feared paralysis. The general practitioners, many of whom had seen cases in previous years, had special lectures and demonstrations, and watched every patient suffering from indefinite illness very closely for the development of a spine sign or other warning symptoms. While it is possible that a few cases were missed, the widespread interest of public and profession makes one confident that the number of sick children not attended by a member of the profession during that period was negligible.

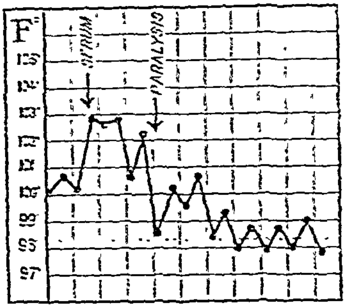
It is admitted that the only accurate method to assess the results of any therapy in preparalytic poliomyelitis would be the treatment of alternate cases, leaving the remainder as controls. In Australia this could not be done. Of the 270 cases of the epidemic, 254 were seen by one of us (J. M.), who was responsible for the after-treatment of the majority of paralysed cases by means of splinting and muscle re-education. It appeared, therefore, that an opportunity was presented to compare the cases treated with serum in the preparalytic stage with the remainder of the cases of the same epidemic.

FIG. 4.



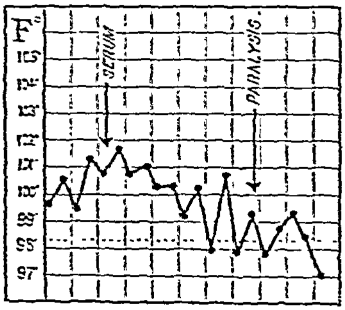
Serum given within 24 hours of paralysis. Satisfactory response.

FIG. 5.



Unsatisfactory response to serum. No second injection was given. Serious paralysis developed.

FIG. 6.



Unsatisfactory response to serum. No second dose was given. Paralysis developed.

STANDARDS OF DISABILITY.

The scheme and standards of the Harvard Infantile Paralysis Commission, as quoted in the article published by Aycock in 1929,[18] were adopted in measuring the degree of paralysis of the cases examined. The scheme may be quoted here:—

> "Five degrees of paralysis are distinguished, depending on the degree of strength shown in the execution of the normal arc of motion with which the particular muscle group is concerned.
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ASSESSMENT OF RESULTS.

In July and August, 1931, muscle examinations were carried out on 88 preparalytic serum-treated cases and 137 of the remainder. The delay between the onset of the disease and muscle examination favoured the controls, for the interval between onset and test averaged 8·5 weeks for the treated cases and their last contribution to the Central Council intimated that the trustees would not be disposed to continue their grants when the L.C.C. had fully developed its powers under the Local Government Act.

Upon the Central Council has fallen the duty of revising and republishing the directory of district nursing and street list for London; the 1918 edition of the directory is now out of date and its value as a reference book makes republication especially desirable from the point of view of hospital almoners, social workers, and general practitioners in the poorer districts of London. It also falls to the Central Council to award bursaries for midwifery training, to which purpose a grant from the London Parochial Charities is directed. Since this special contribution was first made, 36 nurses have been enabled to obtain the C.M.B. certificate. The desirability of extending these bursaries to cover post-certificate courses has recently been discussed, and it has been agreed that applications should be considered for such part of the cost of post-certificate courses as is not met by the Ministry of Health, provided that the candidate will agree to undertake midwifery in London for not less than a year.

A simplification of statistics and accounts is likely to follow the issue of a standard form by the Central Council for circulation among the bodies which come under its organisation. The different modes of presenting income and expenditure accounts made comparison, and the allocation of equitable grants, extremely difficult, and the issue of a standard form is another example of administrative value of the Central Council. District nursing, as Dr. Hogarth pointed out, calls for altruism and a high conception of service in the woman who takes it up, and such devotion, she believes, should not be exploited, even in the interest of the general public. THE LANCET Commission on Nursing noted the valiant efforts of the Nursing Association to obtain funds, and the manifest need for the services of district nurses, but stated their conviction that the pay offered in this field is inadequate. It is to be hoped that these views will receive full recognition in any scheme for reconstruction of the district nursing system.

A SURVEY OF EPIDEMIC ENCEPHALITIS.

THE second report [1] of the Matheson Commission for the study of Epidemic Encephalitis, which has just appeared, is arranged on the same plan as the first,[2] but on a more modest scale. Of its 155 pages considerably more than half are devoted to a continuation of the bibliography of the subject up to the end of 1929. This part of the report should be of great value for purposes of reference. The remainder consists of brief résumés of recent communications grouped under the headings Ætiology, Other Types of Encephalitis, Treatment and Epidemiology. In the second of these is given a table of incidence of post-vaccinal encephalitis in different countries, so far as figures have been available for the purpose. The chapter on treatment aims at recording every drug that has been tried, however rarely or unsuccessfully. Many of the entries might have been omitted without material loss; they serve, however, to indicate the pitfalls of drug treatment in a disease so little amenable to drugs at all. The final chapter contains a brief account of the outbreak of the disease in Japan in 1929. So far the Matheson Commission has limited its reports to the collation and the review of outside work. Since the summer of 1929 however it has been actively engaged in working on material provided at the Columbia University neurological institute, where more than 500 patients, adults and children, have been studied in relation to their response to the vaccines of Rosenow, Levaditi, and Gay. The results, to be published later, will be awaited with interest.

MEDICAL CARE IN INDUSTRY.

A PAPER on the Medical Care of Workers in Industry was read by Dr. N. Howard Mummery to the Epidemiological Section of the Royal Society of Medicine on Friday, Jan. 22nd. The worker, said Dr. Mummery, is to-day so carefully safeguarded that he is in danger of losing his independence and his foresight for himself and his family, and this largely at the expense of the employer of his labour, who is being held responsible for every loss of health, whether due to the employment of the worker or not. The employer is being helped by the Industrial Health Research Board, by the Home Office, and others, but wants good practitioners to assist him in the choice of his workmen in their vocationa selection, in preventing disease by better hygiene in reducing absenteeism, and increasing output. I this work the large factories already employ ove 1000 doctors and 2000 nurses, working under thei direction. Where Dr. Mummery works absenteeis decreases, he said, from year to year; there are 332 men, 1461 women, and in 1930 there were 1564 mal absentees from accidents and illnesses, 1601 femal —a higher proportion of women—but the men we longer absent, averaging 14·12 days, the women 11·0 There was most absenteeism in January, but aft that in summer months. Accidents and illness in frequency varied together; the reduction, ye by year, he ascribed to better immediate treatment injuries, good provision of hospital and convalesce treatment when required. The most numerous cla of illnesses were colds and influenza. Dr. Mumme appealed to practitioners increasingly to devote the attention to the interesting work of assisting industr

BY an Order of the Committee of Privy Counc Mr. W. S. Morrison, M.P., has been appointed member of the Medical Research Council on t retirement of Major A. G. Church.

Dr. W. G. Savage has accepted an invitation to to Boston to deliver the Sedgwick memorial lectu for 1932. He is the first Englishman to hold th lectureship in the nine years since its foundation.

Prof. Grey Turner's address on the Paget Traditio to which we alluded last week (p. 468), was deliver on the occasion of the centenary meeting of t Massachusetts Medical Society. The Bigelow med was awarded him by the Boston Surgical Societ and the lecture he gave on that occasion was entitl Some Experiences in the Surgery of the Œsophagu

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DEEP THERAPY AT NOTTINGHAM.—The Duke Portland last week inaugurated the new deep X ra therapy apparatus which at a cost of £2500 has bee provided to Nottingham General Hospital by t Nottinghamshire council of the British Empire Canc Campaign.

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[1] New York: Columbia University Press. Pp. 155. $1.50.

[2] See THE LANCET, 1929, ii., 1267.

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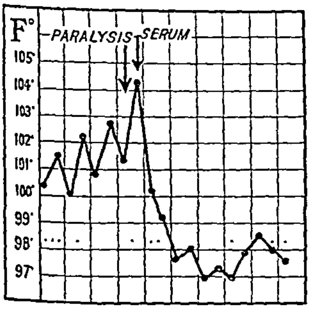

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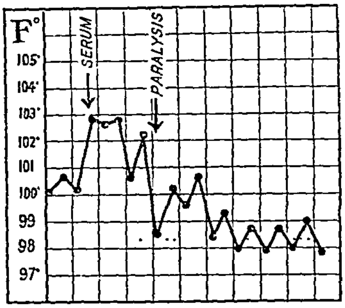

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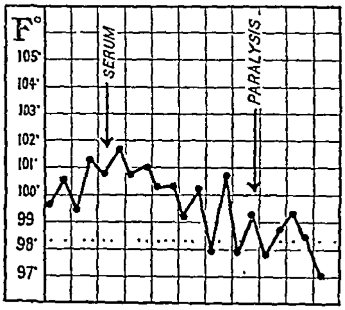

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TABLE III.—*Synopsis of Cases Treated in the Preparalytic Stage by Human Immune Serum.*

Number.	Age and sex.	(1) Date of onset. (2) Date of treatment.	Degrees of temperature.	Spine sign.	Headache.	Clinical details.	Cerebro-spinal fluid findings.				Serum in c.cm.		Date of muscle examination.	Amount of paralysis					
							Cells.	Type of cells.	Globulin	Chlor.§	First dose.	Second dose.		Total.	Good.	Fair.	Poor.	Trace.	Absent.
1	5 M.	12/3/26 13/3/26	100	††	†	Pain in legs and behind knees.	200	lm.	—	—	20 it. 20 iv.	12 iv.	12/4/26	0	0	0	0	0	0
2	4 M.	26/11/26 27/11/26	100	††	†	Pain in legs, diplopia.	30	lm.	—	—	60 iv.	..	8/2/27	2	2	0	0	0	0
3	10 M.	16/4/29 19/4/29	100·4	††	†	Drowsiness, sweating; three others paralysed 17/4/29.	..	..	..	..	20 iv.	..	12/5/29	0	0	0	0	0	0
4	4 M.	5/1/28 6/1/28	99	††	—	Brother paralysed; drowsiness.	35	30 % pm. 70 % lm.	—	—	10 iv. 20im.	..	25/1/28	0	0	0	0	0	0
5	4 M.	28/1/28 29/1/28	99·4	†	†	Pain in leg, drowsiness.	280	20 % pm. 80 % lm.	†	..	40im. 10 it.	..	21/2/28	1	1	0	0	0	0
6	6 M.	6/2/28 10/2/28	105	††††	†	Pain in legs, Amoss's sign, retention, photophobia; 15 hours' delay between puncture and serum.	45	lm.	††	750	50 iv.	30 it. 30 iv.	12/5/28	61	0	0	15	16	30
7	13 M.	6/2/28 15/2/28	104	†	†	Pains in limbs, vomiting.	180	40 % pm. 60 % lm.	†	..	15 it. 105 iv.	..	7/3/28	0	0	0	0	0	0
8	2 M.	12/2/28 20/2/28	101	††	—	Photophobia, drowsiness, retention.	26	lm.	†	..	10 it. 40im.	10im.	23/3/28	0	0	0	0	0	0
9	8 F.	23/2/28 24/2/28	99·4	††	†	Photophobia, pains in legs, hyperæsthesia.	113	28 % lm. 72 % pm.	††	755	30 iv. 20im.	20 it. 20 iv.	12/1/28	5	5	0	0	0	0
				††††	††		390	50 % lm. 50 % pm.	††			30im.							
10	3 F.	24/2/28 27/2/28	101	†††	†	Photophobia, drowsiness, hyperæsthesia; 36 hours' delay between puncture and serum.	..	† lm. pm.	†	760	15 it. 45 iv.	..	1/12/28	160	0	2	6	12	140
11	12 F.	2/3/28 4/3/28	103	†††	†	Brother died; paralysed 1/3/28. Pain in back.	331	† lm.	†	710	18 it. 45 iv. 5im.	..	4/4/28	0	0	0	0	0	0
12	5 M.	16/3/28 18/3/28	101	†	†	Drowsiness, photophobia, absent jerk.	150	90 % lm. 10 % pm.	†	740	19 it. 29 iv. 12im.	20 it. 20 iv.	4/1/28	3	3	0	0	0	0
13	7 F.	16/3/28 19/3/28	101·8	†	†	Pain in legs and neck, drowsiness.	250	8 % pm. 92 % lm.	—	—	20 it. 20im.	20 iv.	12/4/28	0	0	0	0	0	
14	7 M.	16/3/28 19/3/28	100	†††	†	Pain in legs, Amoss's sign.	90	† lm.	†	740	30 it. 30 iv.	..	5/5/28	2	2	0	0	0	
15	7 F.	31/3/28 2/4/28	101	††	†	Contact with 16, 17, 18. Vomiting, pains in legs, tremor of hands.	..	† lm.	—	—	10 it. 10im.	..	30/4/28	0	0	0	0	0	
16	6 F.	7/4/28 9/4/28	101	††	†	Contact with 15, 17, 18. Tremor of hands, malaise, hyperæsthesia.	..	† lm.	—	—	10 it. 10im.	10 it. 30 iv.	30/4/28	1	1	0	0	0	
17	7 M.	17/4/28 18/4/28	102	††	†	Contact with 15, 16, 18. Tremor of hands, pain in back and neck.	150	† lm.	—	—	10 it. 30 iv.	..	30/4/28	0	0	0	0	0	
18	1 M.	9/5/28 10/5/28	101	††	—	Contact with 15, 16, 17. Vomiting, drowsy, tremor.	20	† lm.	†	..	9 it. 30im.	..	30/4/28	0	0	0	0	0	
19	12 F.	12/4/28 14/4/28	99	††	†	Vomiting, drowsy, pain in neck and back.	180	lm.	†	760	30 it. 30 iv.	30 iv. 30im.	15/5/28	0	0	0	0	0	
20	8 M.	7/5/28 10/5/28	101	†††	†	Delirium, pain in neck and back; 12 hours' delay between puncture and serum.	100	lm.	†	720	10 it. 5im.	..	..	Death eight hours later.					
21	11 F.	18/5/28 18/5/28	99	†	†	Pain in back and limbs. Sister of 20.	180	lm. pm.	†	720	11 it. 14im.	..	18/6/28	0	0	0	0	0	
22	5 M.	25/5/28 26/5/28	102	††	†	Drowsy, Amoss's sign, hamstring tenderness.	120	5 % pm. 95 % lm.	†	715	33 it. 47 iv.	30im. 30im.	17/6/28	3	3	0	0	0	
23	8 F.	19/2/28 23/2/28	102	†††	†	Photophobia, pain in neck, vomiting.	90	lm.	†	720	15 it. 45 iv.	30 iv.	20/4/28	2	0	2	0	0	
24	37 F.	7/6/28 11/6/28	100·4	††	††	Drowsy, vomiting, photophobia, pain in back and neck.	8*	lm.	†	720	10 it. 20 iv. 90im.	50im. 40im.	7/7/28	7	7	0	0	0	
25	3 M.	17/6/28 22/6/28	102	†††	††	Photophobia, drowsiness, opisthotonus.	20	lm.	—	720	15 it. 40im.	..	7/11/28	0	0	0	0	0	
26	2 F.	7/1/29 12/1/29	100	††	†	Irritable, falling over.	8*	lm.	—	760	26 it. 44 iv.	..	8/4/29	4	2	2	0	0	
27	6 M.	18/11/28 20/11/28	105	††	†	Delirium, drowsiness, photophobia, vomiting.	200	60 % lm. 40 % pm.	..	..	18 it. 42 iv.	40 iv.	5/12/28	0	0	0	0	0	
28	4 F.	18/1/29 23/1/29	101	††	†	Irritable, delirium, Amoss's sign. Brother paralysed 17/1/29.	5	lm.	†	785	26 it. 64 iv.	..	23/3/29	0	0	0	0	0	
29	4 F.	26/1/29 28/1/29	101·2	†††	†	Vomiting, drowsiness, retention, pain in back and neck.	65	57 % lm. 43 % pm.	†	720	90 iv.	30 it. 8im.	20/2/29	1	1	0	0	0	
30	4 M.	18/2/29 26/2/29	101	††	†	Photophobia, pains in limbs, vomiting.	276	lm. pm.	†	710	17 it. 32 iv.	20 it.	1/4/29	0	0	0	0	0	
31	4 M.	27/2/29 29/2/29	102	††	†	Vomiting, drowsy.	180	65 % lm. 35 % pm.	†	730	15 it. 25im.	20 it. 10 iv.	10/3/29	0	0	0	0	0	
32	8 M.	20/2/29 25/2/29	102	†††	†	Vomiting, pains in back, retention, toxæmia.	40	lm.	†	731	15 it. 25 iv.	..	10/3/29	0	0	0	0	0	
33	7 F.	7/3/29 9/3/29	101	††	†	Pains in back, drowsiness.	70	lm.	†	..	10 it.	10 iv. 10 it. 10 iv.	17/6/29	3	3	0	0	0	
34	10 M.	11/3/29 16/3/29	101·4	†††	†	Amoss's sign, drowsiness.	40	lm.	†	..	9 it. 50 iv.	30 iv.	7/6/29	1	1	0	0	0	
35	5 M.	6/3/29 16/3/29	99·4	†	†	"Influenza 10 days before." Brother paralysed (fatal).	27	lm. pm.	†	730	10 iv. 10 iv. 10im.	..	10/6/29	0	0	0	0	0	
36	8 M.	14/4/29 17/4/29	103·6	†	†	Vomiting, drowsiness, abdominal pain.	120	lm. pm.	†	..	10 it.	..	7/1/29	0	0	0	0	0	
37	9 M.	23/2/29 25/2/29	102	††	†	Photophobia, pain in limbs, drowsiness.	60	lm.	—	..	30 it.	..	24/3/29	0	0	0	0	0	
38	1 M.	11/3/29 13/3/29	102	†††	—	Photophobia, drowsiness, vomiting.	40	lm.	†	..	10 it. 30im.	..	8/4/29	0	0	0	0	0	
39	5 F.	15/3/29 23/3/29	99·6	††	†	Irritable, pain in neck and back, hyperæsthesia.	36	lm.	†	700	12 it. 48 iv.	..	1/6/29	0	0	0	0	0	
40	5 M.	16/3/29 23/3/29	101·6	†††	†	Irritable, drowsiness, Amoss's sign, hyperæsthesia.	150	lm.	††	..	20 it. 20 iv.	30 iv. 30 iv.	7/6/29	3	3	0	0	0	

§ Chlorides in mg. per 100 c.cm.

* Examination delayed.

III.—*Synopsis of Cases Treated in the Preparalytic Stage by Human Immune Serum*—(*continued*).

	1) Date of onset. 2) Date of treatment.	Degrees of temperature.	Spine sign.	Headache.	Clinical details.	Cerebro-spinal fluid findings.				Serum in c.cm.		Date of muscle examination.	Amount of paralysis.					
						Cells.	Type of cells.	Globulin.	Chlor.§	First dose.	Second dose.		Total.	Good.	Fair.	Poor.	Trace.	Absent.
	16/3/29 24/3/29	100	†††	†	Epistaxis, pain in neck, back, limbs; 20 hours' delay between puncture and serum.	90	lm.	..	760	30 iv.	..	1/12/31	30	9	12	9	0	0
	4/10/29 7/10/29	100	††	—	Stiffness in limbs, hyperæsthesia, opisthotonus.	(bs.)	..	..	..	40 iv.	40 iv. 40 it.	3/12/29	0	0	0	0	0	0
	7/10/29 14/10/29	100	††	—	Drowsiness, pain in neck and limbs.	p. 175	lm.	..	..	25 it. 5 im.	..	24/12/29	3	3	0	0	0	0
	2/2/30 5/2/30	101	†	†	Vomiting, drowsiness.	†	lm. pm.	†	..	20 it. 50 iv.	..	1/6/30	0	0	0	0	0	0
	5/2/30 7/2/30	101	†	†	Vomiting, drowsiness.	†	lm.	†	..	20 it. 40 iv.	..	3/5/30	0	0	0	0	0	0
	4/2/30 18/2/30	100	††	†	Vomiting, pain in neck, back, and knees.	20	lm.	†	750	15 it. 35 im.	..	1/4/30	8	4	4	0	0	0
	8/2/30 10/2/30	102	††	†	Photophobia, pain in neck, retention delay after puncture.	120	lm. pm.	†	720	20 it. 70 iv.	..	1/6/30	0	0	0	0	0	0
	1/3/30 5/3/30	101·6	†	†	Irritable, drowsiness, constipation.	40	lm.	†	..	30 im.	..	8/8/31	94	13	20	45	16	0
	1/3/30 6/3/30	100	††	†	Dromedary onset, Amoss's sign, pain in limbs, vomiting.	20	lm.	†	750	20 it. 30 iv.	..	1/6/30	0	0	0	0	0	0
	14/5/30 17/5/30	100	†	†	Hyperæsthesia, vomiting, drowsy.	100	80 % lm. 20 % pm.	†	720	20 it. 70 iv.	..	1/9/30	2	0	2	0	0	0
	11/6/30 16/6/30	104	†††	†	Vomiting, drowsiness, diplopia.	370	60 % lm 40 % pm.	†	..	40 iv.	..	12/8/30	2	2	0	0	0	0
	26/7/30 2/8/30	100	††	—	Hyperæsthesia, delirium, tremor, pain in limbs.	150	lm.	†	750	30 it. 30 iv.	..	23/8/30	0	0	0	0	0	0
	1/8/30 6/8/30	100·6	††	—	Drowsiness, pain in neck.	200	lm.	†	..	20 it. 20 iv.	30 iv.	1/10/30	0	0	0	0	0	0
	29/8/30 3/9/30	101·4	†††	†	Tremor, photophobia, nystagmus, drowsiness.	45	lm. pm.	†	720	20 it. 40 iv.	..	1/1/31	2	2	0	0	0	0
	10/9/30 13/9/30	102	††	†	Delirium, vomiting, drowsiness.	90	lm.	†	..	20 it. 30 iv.	..	4/3/31	0	0	0	0	0	0
	18/9/30 19/9/30	101	†	—	Delirium, vomiting, loss of speech.	50	lm.	†	730	20 it. 40 iv.	..	1/10/30	0	0	0	0	0	0
	19/10/30 20/10/30	101	††	†	Pain in neck and back, tremor of hands.	†	lm.	†	..	10 it. 40 iv.	60 iv.	20/11/30	0	0	0	0	0	0
I.	3/11/30 4/11/30	101	††	†	Vomiting, drowsiness, tremor of hands.	110	85 % lm. 15 % pm.	†	750	29 it. 31 im.	..	30/11/30	0	0	0	0	0	0
I.	16/11/30 18/11/30	103	†††	†	Vomiting, diplopia, tremor, drowsiness.	150	lm.	†	..	15 it. 35 iv.	..	2/2/31	1	1	0	0	0	0
2 I.	26/11/30 23/12/30	100·4	††	†	Epistaxis, vomiting, abdominal pain.	600	lm.	..	..	30 it. 30 iv.	..	8/5/31	0	0	0	0	0	0
1 M.	14/12/30 18/12/30	103·8	†††	†	Delirium, pain in leg, drowsiness.	560	lm.	†	..	20 it. 40 iv.	60 iv.	25/1/31	0	0	0	0	0	0
3 M.	24/12/30 27/12/30	99·6	†	—	Tremor of hands, pain in limbs. Sister paralysed 25/12/30.	62	lm.	—	760	30 it. 20 iv.	..	10/1/31	0	0	0	0	0	0
4 M.	23/1/31 28/1/31	102	†††	†	Drowsiness, pain in neck, retention.	65	90 % lm. 10 % pm.	†	725	15 it. 45 iv.	..	21/6/31	2	2	0	0	0	0
3 M.	1/2/31 4/2/31	101	†	†	Abdominal pain, vomiting, drowsiness.	†	lm.	†	..	15 it. 15 im.	..	2/5/31	0	0	0	0	0	0
6 M.	5/2/31 6/2/31	101	††	†	Vomiting, drowsiness.	†	lm.	†	..	10 it. 5 iv.	20 iv.	7/4/31	0	0	0	0	0	0
2 M.	11/2/31 15/2/31	102·6	††	—	Drowsiness, retention.	30	lm.	..	720	20 it.	30 iv.	10/5/31	0	0	0	0	0	0
7 M.	16/2/31 17/2/31	101	††	†	Drowsiness, persistent vomiting.	120	lm.	..	720	24 it. 30 iv.	..	26/2/31	0	0	0	0	0	0
5 M.	16/2/31 18/2/31	99·8	††	—	Drowsiness, tremor of hands, facial paresis.	..	(bs.)	..	..	5 it. 25 im.	..	6/3/31	0	0	0	0	0	0
3 M.	9/2/31 11/2/31	100	†	—	Irritable, drowsy.	†	lm.	†	750	10 it. 50 iv.	..	25/2/31	0	0	0	0	0	0
17 F.	26/2/31 7/3/31	103	†††	†	Abdominal pain, diplopia, retention, vertigo.	12	lm.	†	720	60 iv.	60 iv.	1/8/31	3	1	2	0	0	0
8 M.	27/2/31 12/3/31	101	††	†	Dromedary onset, tremor, vomiting.	100	lm.	†	..	30 it. 30 iv.	..	27/4/31	0	0	0	0	0	0
5 M.	20/3/31 21/3/31	100	†	†	Brother of 71. Abdominal pain, drowsiness.	90	lm. pm.	..	..	30 it. 30 iv.	..	27/4/31	0	0	0	0	0	0
5 M.	10/3/31 12/3/31	101	†	†	Drowsiness, sweating, giddiness.	100	lm.	..	..	30 it. 30 iv.	..	19/3/31	0	0	0	0	0	0
10 F.	14/3/31 21/3/31	100	††	†	Sister paralysed 14/3/31. Malaise.	175	lm.	†	..	30 it. 30 iv.	..	4/4/31	1	1	0	0	0	0
5 F.	16/3/31 17/3/31	102	††	†	Vomiting, pain in neck.	200	50 % lm. 50 % pm.	..	..	30 it.	..	10/7/31	6	2	4	0	0	0
6 M.	3/3/31 4/3/31	99·8	†	†	Convulsion, pain in neck, giddiness.	20	lm.	..	720	15 it. 45 iv.	..	12/5/31	0	0	0	0	0	0
4 M.	20/3/31 28/3/31	101	†††	†	Irritability, tremor, retention.	†	lm.	..	..	30 it. 30 iv.	..	8/4/31	0	0	0	0	0	0
10 M.	1/4/31 10/4/31	99	†††	†	Dromedary onset, photophobia, severe; pains in limbs.	20	lm.	..	740	20 it. 30 iv.	..	16/6/31	2	2	0	0	0	0
7 M.	7/4/31 10/4/31	101	†††	†	Vomiting, drowsiness, tremor and toxæmia.	60	lm.	†	730	30 it. 30 iv.	..	16/5/31	0	0	0	0	0	0
5 M.	13/4/31 16/4/31	100	†	†	Drowsiness, tremor, pain in back.	50	60 % lm. 40 % pm.	†	..	30 it. 30 iv.	..	16/7/31	4	0	4	0	0	0
1 10 M.	15/4/31 16/4/31	102	††	†	Pain in neck, back, and in right arm.	300	32 % lm. 68 % pm.	†	..	30 it. 50 iv.	..	24/7/31	1	1	0	0	0	0
2 10 M.	27/4/31 29/4/31	102	††	†	Vomiting, abdominal and popliteal pain.	1100	lm. pm.	†	..	20 it. 50 iv.	..	8/5/31	0	0	0	0	0	0
3 4 F.	30/4/31 2/5/31	103	††	†	Photophobia, malaise, tremor of hands.	180	25 % lm. 75 % pm.	†	..	30 it. 40 iv.	440 iv.	10/5/31 6/8/31	3 1	3 1	0 0	0 0	0 0	0 0
4 9 F.	1/4/31 9/4/31	103·8	††††	†	Dromedary onset, tremor, retention, hyperæsthesia.	450	lm.	†	720	25 it. 55 iv. 30 im.	..	24/7/31	0	0	0	0	0	0
35 3 M.	2/4/31 7/4/31	101	†††	†	Dromedary onset, pain in right arm, tremor of hands.	300	lm.	†	730	30 it. 35 iv.	..	1/5/31	2	2	0	0	0	0
36 4 M.	3/4/31 7/4/31	100	†	†	Hyperæsthesia of thighs, tremor, pain in neck.	200	lm.	†	..	30 it. 30 iv.	..	18/4/31	1	1	0	0	0	0

§ Chlorides in mg. per 100 c.cm. (bs.) = blood-stained.

TABLE III.—*Synopsis of Cases Treated in the Preparalytic Stage by Human Immune Serum.*

Number.	Age and sex.	(1) Date of onset. (2) Date of treatment.	Degrees of temperature.	Spine sign.	Headache.	Clinical details.	Cerebro-spinal fluid findings.				Serum in c.cm.		Date of muscle examination.	Amount of paralysis.					
							Cells.	Type of cells.	Globulin	Chlor.§	First dose.	Second dose.		Total.	Good.	Fair.	Poor.	Trace.	Absent.
1	5 M.	12/3/26 13/3/26	100	††	†	Pain in legs and behind knees.	200	lm.	—	—	20 it. 20 iv.	12 iv.	12/4/26	0	0	0	0	0	0
2	4 M.	26/11/26 27/11/26	100	††	†	Pain in legs, diplopia.	30	lm.	—	—	60 iv.	..	8/2/27	2	2	0	0	0	0
3	10 M.	16/4/29 19/4/29	100·4	††	†	Drowsiness, sweating; three others paralysed 17/4/29.	..	..	..	..	20 iv.	..	12/5/29	0	0	0	0	0	0
4	4 M.	5/1/28 6/1/28	99	††	—	Brother paralysed; drowsiness.	35	30 % pm. 70 % lm.	—	—	10 iv. 20 im.	..	25/1/28	0	0	0	0	0	0
5	4 M.	28/1/28 29/1/28	99·4	†	†	Pain in leg, drowsiness.	280	20 % pm. 80 % lm.	†	..	40 im. 10 it.	..	21/2/28	1	1	0	0	0	0
6	6 M.	6/2/28 10/2/28	105	††††	†	Pain in legs, Amoss's sign, retention, photophobia; 15 hours' delay between puncture and serum.	45	lm.	††	750	50 iv.	30 it. 30 iv.	12/5/28	61	0	0	15	16	30
7	13 M.	6/2/28 15/2/28	104	†	†	Pains in limbs, vomiting.	180	40 % pm. 60 % lm.	†	..	15 it. 105 iv.	..	7/3/28	0	0	0	0	0	0
8	2 M.	12/2/28 20/2/28	101	††	—	Photophobia, drowsiness, retention.	26	lm.	†	..	10 it. 40 im.	10 im.	23/3/28	0	0	0	0	0	0
9	8 F.	23/2/28 24/2/28	99·4	††	†	Photophobia, pains in legs, hyperæsthesia.	113	28 % lm. 72 % pm.	††	755	30 iv. 20 im.	20 it. 20 iv. 30 im.	12/4/28	5	5	0	0	0	0
				††††	††		390	50 % lm. 50 % pm.	††										
10	3 F.	24/2/28 27/2/28	101	†††	†	Photophobia, drowsiness, hyperæsthesia; 36 hours' delay between puncture and serum.	..	† lm. pm.	†	760	15 it. 45 iv.	..	1/12/28	160	0	2	6	12	140
11	12 F.	2/3/28 4/3/28	103	†††	†	Brother died; paralysed 1/3/28. Pain in back.	331	† lm.	†	710	18 it. 45 iv. 5 im.	..	4/4/28	0	0	0	0	0	0
12	5 M.	16/3/28 18/3/28	101	†	†	Drowsiness, photophobia, absent jerk.	150	90 % lm. 10 % pm.	†	740	19 it. 29 iv. 12 im.	20 it. 20 iv.	4/4/28	3	3	0	0	0	0
13	7 F.	16/3/28 19/3/28	101·8	†	†	Pain in legs and neck, drowsiness.	250	8 % pm. 92 % lm.	—	—	20 it. 20 im.	20 iv.	12/4/28	0	0	0	0	0	0
14	7 M.	16/3/28 19/3/28	100	†††	†	Pain in legs, Amoss's sign.	90	† lm.	†	740	30 it. 30 iv.	..	5/5/28	2	2	0	0	0	0
15	7 F.	31/3/28 2/4/28	101	††	†	Contact with 16, 17, 18. Vomiting, pains in legs, tremor of hands.	..	† lm.	—	—	10 it. 10 im.	..	30/4/28	0	0	0	0	0	0
16	6 F.	7/4/28 9/4/28	101	††	†	Contact with 15, 17, 18. Tremor of hands, malaise, hyperæsthesia.	..	† lm.	—	—	10 it. 10 im.	10 it. 30 iv.	30/4/28	1	1	0	0	0	
17	7 M.	17/4/28 18/4/28	102	††	†	Contact with 15, 16, 18. Tremor of hands, pain in back and neck.	150	† lm.	—	—	10 it. 30 iv.	..	30/4/28	0	0	0	0	0	
18	1 M.	9/5/28 10/5/28	101	††	—	Contact with 15, 16, 17. Vomiting, drowsy, tremor.	20	† lm.	†	..	9 it. 30 im.	..	30/4/28	0	0	0	0	0	
19	12 F.	12/4/28 14/4/28	99	††	†	Vomiting, drowsy, pain in neck and back.	180	lm.	†	760	30 it. 30 iv.	30 iv. 30 im.	15/5/28	0	0	0	0	0	
20	8 M.	7/5/28 10/5/28	101	†††	†	Delirium, pain in neck and back; 12 hours' delay between puncture and serum.	100	lm.	†	720	10 it. 5 im.	..	..	Death eight hours later.					
21	11 F.	18/5/28 18/5/28	99	†	†	Pain in back and limbs. Sister of 20.	180	lm. pm.	†	720	11 it. 14 im.	..	18/6/28	0	0	0	0	0	
22	5 M.	25/5/28 26/5/28	102	††	†	Drowsy, Amoss's sign, hamstring tenderness.	120	5 % pm. 95 % lm.	†	715	33 it. 47 iv.	30 im. 30 im.	17/6/28	3	3	0	0	0	
23	8 F.	19/2/28 23/2/28	102	†††	†	Photophobia, pain in neck, vomiting.	90	lm.	†	720	15 it. 45 iv.	30 iv.	20/4/28	2	0	2	0	0	
24	37 F.	7/6/28 11/6/28	100·4	††	††	Drowsy, vomiting, photophobia, pain in back and neck.	8*	lm.	†	720	10 it. 20 iv. 90 im.	50 im. 40 im.	7/7/28	7	7	0	0	0	
25	3 M.	17/6/28 22/6/28	102	†††	††	Photophobia, drowsiness, opisthotonus.	20	lm.	—	720	15 it. 40 im.	..	7/11/28	0	0	0	0	0	
26	2 F.	7/1/29 12/1/29	100	††	†	Irritable, falling over.	8*	lm.	—	760	26 it. 44 iv.	..	8/4/29	4	2	2	0	0	
27	6 M.	18/11/28 20/11/28	105	††	†	Delirium, drowsiness, photo-	200	60 % lm. 40 % pm.	..	..	18 it. 42 iv.	40 iv.	5/12/28	0	0	0	0	0	
28	4 F.	18/1/29 23/1/29	101	††	†	ign.	5	lm.	†	785	26 it. 64 iv.	..	23/3/29	0	0	0	0	0	
29	4 F.	26/1/29 28/1/29	101·2	†††	†	Vomiting, drowsiness, retention, pain in back and neck.	65	57 % lm. 43 % pm.	†	720	90 iv.	30 it. 8 im.	20/2/29	1	1	0	0	0	
30	4 M.	18/2/29 26/2/29	101	††	†	Photophobia, pains in limbs, vomiting.	276	lm. pm.	†	710	17 it. 32 iv.	20 it.	1/4/29	0	0	0	0	0	
31	4 M.	27/2/29 29/2/29	102	††	†	Vomiting, drowsy.	180	65 % lm. 35 % pm.	†	730	15 it. 25 im.	20 it. 10 iv.	10/3/29	0	0	0	0	0	
32	8 M.	20/2/29 25/2/29	102	†††	†	Vomiting, pains in back, retention, toxæmia.	40	lm.	†	731	15 it. 25 iv.	..	10/3/29	0	0	0	0	0	
33	7 F.	7/3/29 9/3/29	101	††	†	Pains in back, drowsiness.	70	lm.	†	..	10 it.	40 iv. 10 it. 10 iv.	17/6/29	3	3	0	0	0	
34	10 M.	11/3/29 16/3/29	101·4	†††	†	Amoss's sign, drowsiness.	40	lm.	†	..	9 it. 50 iv.	30 iv.	7/6/29	1	1	0	0	0	
35	5 M.	6/3/29 16/3/29	99·4	†	†	"Influenza 10 days before." Brother paralysed (fatal).	27	lm. pm.	†	730	10 iv. 10 iv. 10 im.	..	10/6/29	0	0	0	0	0	
36	8 M.	14/4/29 17/4/29	103·6	†	†	Vomiting, drowsiness, abdominal pain.	120	lm. pm.	†	..	10 it.	..	7/4/29	0	0	0	0	0	
37	9 M.	23/2/29 25/2/29	102	††	†	Photophobia, pain in limbs, drowsiness.	60	lm.	—	..	30 it.	..	24/3/29	0	0	0	0	0	
38	1 M.	11/3/29 13/3/29	102	†††	—	Photophobia, drowsiness, vomiting.	40	lm.	†	..	10 it. 30 im.	..	8/4/29	0	0	0	0	0	
39	5 F.	15/3/29 23/3/29	99·6	††	†	Irritable, pain in neck and back, hyperæsthesia.	36	lm.	†	700	12 it. 48 iv.	..	1/6/29	0	0	0	0	0	
40	5 M.	16/3/29 23/3/29	101·6	†††	†	Irritable, drowsiness, Amoss's sign, hyperæsthesia.	150	lm.	††	..	20 it. 20 iv.	30 iv. 30 iv.	7/6/29	3	3	0	0	0	

§ Chlorides in mg. per 100 c.cm. * Examination delayed.

TABLE III.—*Synopsis of Cases Treated in the Preparalytic Stage by Human Immune Serum*—(*continued*).

Number.	Age and sex.	(1) Date of onset. (2) Date of treatment.	Degrees of temperature.	Spine sign.	Headache.	Clinical details.	Cerebro-spinal fluid findings.				Serum in c.cm.		Date of muscle examination.	Amount of paralysis.					
							Cells.	Type of cells.	Globulin.	Chlor.§	First dose.	Second dose.		Total.	Good.	Fair.	Poor.	Trace.	Absent.
41	5 F.	16/3/29 24/3/29	100	†††	†	Epistaxis, pain in neck, back, limbs; 20 hours' delay between puncture and serum.	90	lm.	..	760	30 iv.	..	1/12/31	30	9	12	9	0	0
42	9 M.	4/10/29 7/10/29	100	††	—	Stiffness in limbs, hyperæsthesia, opisthotonus.	(bs.) p.	..	..	..	40 iv.	40 iv. 40 it.	3/12/29	0	0	0	0	0	0
43	4 M.	7/10/29 14/10/29	100	††	—	Drowsiness, pain in neck and limbs.	175	lm.	..	..	25 it. 5 im.	..	24/12/29	3	3	0	0	0	0
44	6 F.	2/2/30 5/2/30	101	†	†	Vomiting, drowsiness.	†	lm. pm.	†	..	20 it. 50 iv.	..	1/6/30	0	0	0	0	0	0
45	4 M.	5/2/30 7/2/30	101	†	†	Vomiting, drowsiness.	†	lm.	†	..	20 it. 40 iv.	..	3/5/30	0	0	0	0	0	0
46	3 F.	4/2/30 18/2/30	100	††	†	Vomiting, pain in neck, back, and knees.	20	lm.	†	750	15 it. 35 im.	..	1/4/30	8	4	4	0	0	0
47	19 M.	8/2/30 10/2/30	102	††	†	Photophobia, pain in neck, retention delay after puncture.	120	lm. pm.	†	720	20 it. 70 iv.	..	1/6/30	0	0	0	0	0	0
48	2 F.	1/3/30 5/3/30	101·6	†	†	Irritable, drowsiness, constipation.	40	lm.	†	..	30 im.	..	8/8/31	94	13	20	45	16	0
49	9 M.	1/3/30 6/3/30	100	††	†	Dromedary onset. Amoss's sign, pain in limbs, vomiting.	20	lm.	†	750	20 it. 30 iv.	..	1/6/30	0	0	0	0	0	0
50	2 M.	14/5/30 17/5/30	100	†	†	Hyperæsthesia, vomiting, drowsy.	100	80 % lm. 20 % pm.	†	720	20 it. 70 iv.	..	1/9/30	2	0	2	0	0	0
51	7 M.	11/6/30 16/6/30	104	†††	†	Vomiting, drowsiness, diplopia.	370	60 % lm 40 % pm.	†	..	40 iv.	..	12/8/30	2	2	0	0	0	0
52	4 M.	26/7/30 2/8/30	100	††	—	Hyperæsthesia, delirium, tremor, pain in limbs.	150	lm.	†	750	30 it. 30 iv.	..	23/8/30	0	0	0	0	0	0
53	5 F.	1/8/30 6/8/30	100·6	††	—	Drowsiness, pain in neck.	200	lm.	†	..	20 it. 20 iv.	30 iv.	1/10/30	0	0	0	0	0	0
54	7 M.	29/8/30 3/9/30	101·4	†††	†	Tremor, photophobia, nystagmus, drowsiness.	45	lm. pm.	†	720	20 it. 40 iv.	..	1/1/31	2	2	0	0	0	0
55	8 F.	10/9/30 13/9/30	102	††	†	Delirium, vomiting, drowsiness.	90	lm.	†	..	20 it. 30 iv.	..	4/3/31	0	0	0	0	0	0
56	5 F.	18/9/30 19/9/30	101	†	—	Delirium, vomiting, loss of speech.	50	lm.	†	730	20 it. 40 iv.	..	1/10/30	0	0	0	0	0	0
57	13 F.	19/10/30 20/10/30	101	††	†	Pain in neck and back, tremor of hands.	†	lm.	†	..	10 it. 40 iv.	60 iv.	20/11/30	0	0	0	0	0	0
58	3 M.	3/11/30 4/11/30	101	††	†	Vomiting, drowsiness, tremor of hands.	110	85 % lm. 15 % pm.	†	750	29 it. 31 im.	..	30/11/30	0	0	0	0	0	0
59	4 M.	16/11/30 18/11/30	103	†††	†	Vomiting, diplopia, tremor, drowsiness.	150	lm.	†	..	15 it. 35 iv.	..	2/2/31	1	1	0	0	0	0
60	12 M.	26/11/30 23/12/30	100·4	††	†	Epistaxis, vomiting, abdominal pain.	600	lm.	..	..	30 it. 30 iv.	..	8/5/31	0	0	0	0	0	0
61	11 M.	14/12/30 18/12/30	103·8	†††	†	Delirium, pain in leg, drowsiness.	560	lm.	†	..	20 it. 40 iv.	60 iv.	25/1/31	0	0	0	0	0	0
62	3 M.	24/12/30 27/12/30	99·6	†	—	Tremor of hands, pain in limbs, Sister paralysed 25/12/30.	62	lm.	—	760	30 it. 20 iv.	..	10/1/31	0	0	0	0	0	0
63	4 M.	23/1/31 28/1/31	102	†††	†	Drowsiness, pain in neck, retention.	65	90 % lm. 10 % pm.	†	725	15 it. 45 iv.	..	21/6/31	2	2	0	0	0	0
64	3 M.	1/2/31 4/2/31	101	†	†	Abdominal pain, vomiting, drowsiness.	†	lm.	†	..	15 it. 15 im.	..	2/5/31	0	0	0	0	0	0
65	6 M.	5/2/31 6/2/31	101	††	†	Vomiting, drowsiness.	†	lm.	†	..	10 it. 5 iv.	20 iv.	7/4/31	0	0	0	0	0	0
66	2 M.	11/2/31 15/2/31	102·6	††	—	Drowsiness, retention.	30	lm.	..	720	20 it.	30 iv.	10/5/31	0	0	0	0	0	0
67	7 M.	16/2/31 17/2/31	101	††	†	Drowsiness, persistent vomiting.	120	lm.	..	720	24 it. 30 iv.	..	26/2/31	0	0	0	0	0	0
68	5 M.	16/2/31 18/2/31	99·8	††	—	Drowsiness, tremor of hands. facial paresis.	..	(bs.)	..	..	5 it. 25 im.	..	6/3/31	0	0	0	0	0	0
69	3 M.	9/2/31 11/2/31	100	†	—	Irritable, drowsy.	†	lm.	†	750	10 it. 50 iv.	..	25/2/31	0	0	0	0	0	0
70	17 F.	26/2/31 7/3/31	103	†††	†	Abdominal pain, diplopia, retention, vertigo.	12	lm.	†	720	60 iv.	60 iv.	1/8/31	3	1	2	0	0	0
71	8 M.	27/2/31 12/3/31	101	††	†	Dromedary onset, tremor, vomiting.	100	lm.	†	..	30 it. 30 iv.	..	27/4/31	0	0	0	0	0	0
72	5 M.	20/3/31 21/3/31	100	†	†	Brother of 71. Abdominal pain, drowsiness.	90	lm. pm.	..	..	30 it. 30 iv.	..	27/4/31	0	0	0	0	0	0
73	5 M.	10/3/31 12/3/31	101	†	†	Drowsiness, sweating, giddiness.	100	lm.	..	..	30 it. 30 iv.	..	19/3/31	0	0	0	0	0	0
74	10 F.	14/3/31 21/3/31	100	††	†	Sister paralysed 14/3/31. Malaise.	175	lm.	†	..	30 it. 30 iv.	..	4/4/31	1	1	0	0	0	0
75	5 F.	16/3/31 17/3/31	102	††	†	Vomiting, pain in neck.	200	50 % lm. 50 % pm.	..	..	30 it.	..	10/7/31	6	2	4	0	0	0
76	6 M.	3/3/31 4/3/31	99·8	†	†	Convulsion, pain in neck, giddiness.	20	lm.	..	720	15 it. 45 iv.	..	12/5/31	0	0	0	0	0	0
77	4 M.	20/3/31 28/3/31	101	†††	†	Irritability, tremor, retention.	†	lm.	..	..	30 it. 30 iv.	..	8/4/31	0	0	0	0	0	0
78	10 M.	1/4/31 10/4/31	99	†††	†	Dromedary onset, photophobia, severe; pains in limbs.	20	lm.	..	740	20 it. 30 iv.	..	16/6/31	2	2	0	0	0	0
79	7 M.	7/4/31 10/4/31	101	†††	†	Vomiting, drowsiness, tremor and toxæmia.	60	lm.	†	730	30 it. 30 iv.	..	16/5/31	0	0	0	0	0	0
80	5 M.	13/4/31 16/4/31	100	†	†	Drowsiness, tremor, pain in back.	50	60 % lm. 40 % pm.	†	..	30 it. 30 iv.	..	16/7/31	4	0	4	0	0	0
81	10 M.	15/4/31 16/4/31	102	††	†	Pain in neck, back, and in right arm.	300	32 % lm. 68 % pm.	†	..	30 it. 50 iv.	..	24/7/31	1	1	0	0	0	0
82	10 M.	27/4/31 29/4/31	102	††	†	Vomiting, abdominal and popliteal pain.	1100	lm. pm.	†	..	20 it. 50 iv.	..	8/5/31	0	0	0	0	0	0
83	4 F.	30/4/31 2/5/31	103	††	†	Photophobia, malaise, tremor of hands.	180	25 % lm. 75 % pm.	†	..	30 it. 40 iv.	40 iv.	10/5/31	3	3	0	0	0	0
84	9 F.	1/4/31 9/4/31	103·8	††††	†	Dromedary onset, tremor, retention, hyperæsthesia.	450	lm.	†	720	25 it. 55 iv. 30 im.	..	6/8/31 24/7/31	1 0	1 0	0 0	0 0	0 0	0 0
85	3 M.	2/4/31 7/4/31	101	†††	†	Dromedary onset, pain in right arm. tremor of hands.	300	lm.	†	730	30 it. 35 iv.	..	1/5/31	2	2	0	0	0	0
86	4 M.	3/4/31 7/4/31	100	†	†	Hyperæsthesia of thighs, tremor, pain in neck.	200	lm.	†	..	30 it. 30 iv.	..	18/4/31	1	1	0	0	0	0

§ Chlorides in mg. per 100 c.cm. (bs.) = blood-stained.

TABLE III.—*Synopsis of Cases Treated in the Preparalytic Stage by Human Immune Serum*—(continu

Number.	Age and sex.	(1) Date of onset. (2) Date of treatment.	Degrees of temperature.	Spine sign.	Headache.	Clinical details.	Cerebro-spinal fluid findings.				Serum in c.cm.		Date of muscle examination.	Amount o paralysis.				
							Cells.	Type of cells.	Globulin.	Chlor.	First dose.	Second dose.		Total.	Good.	Fair.	Poor.	
87	2 M.	10/4/31 10/4/31	104	††	†	Vomiting, irritability.	16	lm.	†	750	20 it. 50 iv.	..	25/4/31	2	2	0	0	
8	8 M.	10/4/31 13/4/31	100	††	†	Drowsiness, vomiting. Brother paralysed 11/4/31.	†	lm.	..	..	30 it. 30 iv.	30 iv.	3/6/31	0	0	0	0	
9	4 F.	16/4/31 18/4/31	103	†††	†	Pain in abdomen and limbs.	150	lm.	..	..	20 it. 30 iv.	..	17/7/31	0	0	0	0	
0	8 F.	23/4/31 26/4/31	103	††	†	Giddiness, pain in neck, loss of speech.	120	lm.	..	730	50 iv.	..	30/7/31	3	3	0	0	
1	5 M.	24/3/31 27/3/31	101	†	†	Pain in neck and limbs.	180	lm.	..	..	30 it. 20 iv.	..	22/7/31	23	10	4	9	
2	24 F.	25/4/31 30/4/31	100	††	—	Malaise, nystagmus. Sister paralysed 1/5/31 (fatal).	No lumbar puncture.				70 iv.	..	23/7/31	1	1	0	0	
3	3 F.	26/4/31 30/4/31	103	††	†	Irritability, drowsiness.	25	pm. lm.	†	710	10 it. 50 iv.	..	8/7/31	1	1	0	0	
	4 M.	30/4/31 3/5/31	102	††	†	Vomiting, pain in legs, drowsiness.	60	pm. lm.	..	..	15 it. 15 iv.	..	1/8/31	2	2	0	0	
	3 M.	1/5/31 2/5/31	102	††	†	Vomiting, irritable, constipated.	150	70 % pm. 30 % lm.	..	..	30 it. 40 iv.	..	6/8/31	1	1	0	0	
	3 F.	2/5/31 9/5/31	101	†	—	Drowsiness, retention, irritability.	200	lm. pm.	..	..	30 it. 30 iv.	..	24/7/31	6	6	0	0	
	3 M.	2/5/31 7/5/31	100	†	—	Drowsiness, retention.	100	lm.	..	..	30 it. 30 iv.	..	3/8/31	0	0	0	0	
	5 M.	3/5/31 5/5/31	101	††	†	Stiffness, falling over, pain in neck.	230	lm. pm.	†	..	30 it. 40 iv.	..	1/8/31	1	1	0	0	
	1 M.	1/5/31 5/5/31	103	††	—	Vomiting, drowsiness, retention.	20	lm.	†	725	30 it. 40 iv.	..	1/8/31	0	0	0	0	
	6 F.	5/5/31 6/5/31	102·4	††	†	Drowsiness, pain in neck and back.	100	lm.	†	..	30 it. 30im.	..	3/8/31	2	2	0	0	
	1 M.	7/5/31 11/5/31	104	††	—	Drowsiness, constipation.	580	70 % pm. 30 % lm.	†	..	30 it. 40 iv.	..	30/7/31	2	2	0	0	
	9 M.	7/5/31 9/5/31	103	†	†	Abdominal pain, tremor.	150	lm. pm.	†	..	30 it. 30 iv.	..	16/5/31 17/7/31	3 0	3 0	0 0	0 0	
	3 M.	8/5/31 12/5/31	103	†††	—	Vomiting, tremor, irritability.	480	60 % pm. 40 % lm.	†	740	30 it. 30 iv.	..	24/7/31	5	5	0	0	
	10 M.	2/5/31 4/5/31	103	††	†	Epistaxis, pain in back, tremor.	260	60 % pm. 40 % lm.	†	..	30 it. 40 iv.	..	12/7/31	1	1	0	0	
	8 M.	8/5/31 10/5/31	101·8	†††	†	Pain in calves.	†	lm.	†	..	10 it. 10 iv.	10 iv.	1/6/31	0	0	0	0	
	2 F.	10/5/31 11/5/31	102	††	—	Vomiting, drowsiness.	160	60 % pm. 40 % lm.	†	..	30 it. 40 iv.	..	24/7/31	0	0	0	0	
	9 F.	11/5/31 14/5/31	101	†††	—	Delirium, pain in right arm, tremor.	40	50 % pm. 50 % lm.	†	..	30 it. 40 iv.	..	10/7/31	0	0	0	0	
	5 F.	12/5/31 16/5/31	101	††	—	Drowsiness, pain in neck.	170	18 % pm. 82 % lm.	†	..	30 it. 40 iv.	..	17/7/31	1	1	0	0	
	4 F.	13/5/31 15/5/31	100	†††	—	Vomiting, retention, irritability.	150	92 % pm. 8 % lm.	..	..	30 it. 40 iv.	..	10/7/31	1	1	0	0	
	3 M.	13/5/31 26/5/31	102	††	†	Dromedary onset, drowsiness.	500	pm. lm.	..	..	30 it. 40 iv.	..	17/7/31	0	0	0	0	
	5 M.	13/5/31 14/5/31	101	†††	†	Abdominal pain, tremor Amoss's sign, toxæmia.	2000	90 % pm. 10 % lm.	††	..	30 it. 40 iv.	..	21/7/31	71	16	4	12	2
	9	11/5/31 15/5/31	101	†	†	Stiffness, pain in back and abdomen.	300	70 % pm. 30 % lm.	†	720	20 it. 60 iv.	50 iv.	3/8/31	2	2	0	0	
	2 F.	12/5/31 20/5/31	100	†	—	Dromedary onset, abdominal pain, drowsiness.	120	60 % lm. 40 % pm.	†	730	30 it. 40 iv.	..	27/7/31	0	0	0	0	
	6 M.	13/5/31 17/5/31	101·2	††	†	Irritability, drowsiness.	260	20 % lm. 80 % pm.	..	..	30 it. 40 iv.	..	30/7/31	36	24	6	6	
	6	15/5/31 22/5/31	101	††	†	Dromedary onset, tremor, pain in neck.	200	40 % lm. 60 % pm.	†	..	30 it. 40 iv.	..	23/7/31	0	0	0	0	
	9	16/5/31 24/5/31	100	††	†	Dizziness, pain in neck, photophobia, diplopia.	40	40 % lm. 60 % pm.	..	730	30 it. 30 iv.	..	23/7/31	1	1	0	0	
	2	17/5/31 19/5/31	102	†	†	Vomiting, drowsiness.	40	25 % lm. 75 % pm.	..	..	20 it. 20 iv.	..	24/7/31	1	1	0	0	
		14/5/31 17/5/31	101	†	†	Vomiting, pain in neck, irritability.	120	pm. lm.	..	..	30 it. 30 iv.	..	27/7/31	61	16	34	6	
		17/5/31 18/5/31	101	††	†	Vomiting.	120	66 % lm. 33 % pm.	..	..	30 it. 40 iv.	..	17/7/31	1	1	0	0	
		26/5/31 4/6/31	104	††	†	Drowsiness, vomiting, diarrhœa.	40	lm.	..	..	15 it. 50 iv.	..	17/7/31	2	2	0	0	
		18/5/31 25/5/31	101	†	..	Drowsiness, vomiting, retention.	237	60 % lm. 40 % pm.	..	720	10 it. 30 iv.	..	7/6/31	5	5	0	0	0
		9/5/31 11/5/31	101	†	—	Drowsiness, diplopia.	..	(bs.)	..	..	20 it.	..	1/8/31	1	1	0	0	0
		21/5/31 27/5/31	101	†	†	Vomiting, pain in back, retention.	150	32 % lm. 68 % pm.	†	731	30 it. 70 iv.	90 iv.	1/8/31	0	0	0	0	0
		24/5/31 26/5/31	102·4	††	†	Vomiting, drowsiness.	200	50 % lm. 50 % pm.	..	..	30 it. 30 iv.	..	1/8/31	0	0	0	0	0
		24/5/31 28/5/31	99	†	†	Giddiness, stupor, nystagmus.	10	lm.	..	720	70 iv.	..	23/7/31	5	5	0	0	0
		27/5/31 28/5/31	101	†	†	Drowsiness, pain in limbs.	80	70 % pm. 30 % lm.	..	..	30 it. 50 iv.	..	23/7/31	0	0	0	0	0
		28/5/31 4/6/31	102	†††	†	Vomiting, pain in neck and shoulders.	95	54 % pm. 41 % lm.	..	..	30 it. 60 iv.	40 iv.	12/8/31	0	0	0	0	0
		2/6/31 3/6/31	100	†	†	Marked irritability, pain in head.	200	lm.	..	..	40 it. 40 iv.	..	17/7/31	0	0	0	0	0
		1/6/31 3/6/31	103	††	†	Giddiness, drowsiness, vomiting.	180	lm.	..	..	30 it. 30 iv.	..	28/7/31	0	0	0	0	0
		5/6/31 6/6/31	102	††	†	Pain in neck, giddiness.	123	100 % pm. 23 % lm.	†	720	30 it. 40 iv.	40 iv.	3/8/31	1	1	0	0	0
		20/6/31 22/6/31	102	†	†	Vomiting, pain in back and abdomen.	150	lm.	..	710	30 it. 30 iv.	..	17/7/31	0	0	0	0	0
		21/6/31 24/6/31	102	†	†	Vomiting, drowsiness, pain in neck.	250	lm.	..	..	20 it. 50 iv.	..	23/7/31	0	0	0	0	0
		24/6/31 26/6/31	101	††	†	Convulsion, drowsiness, retention	†	lm.	†	..	40 iv.	..	7/8/31	0	0	0	0	0
plete series of treated cases, 1925–1931. Number 133.						Total muscle examinations (132)								653	183	104	108	68
						Average paralysis per case								4·9	1·39	0·78	0·8	0·5

weeks for the remainder. During that interval entical after-treatment had been carried out in the ralysed cases of both groups. Of 254 cases seen y one of us, 12 apparently successful preparalytic rum cases must be omitted from the series because ridence is incomplete; contamination of the cerebro-inal fluid by blood prevented an accurate cell count. ifteen paralysed cases of moderate and severe egree must be omitted because examinations accord-ig to this method could not be undertaken. The omparison is therefore between 76 cases treated by erum in the preparalytic stage and 151 others, hile the condition of an additional 27 is known. The survey, therefore, may be regarded as representative of the total case incidence of 270 cases. Details of the histories of cases treated in the preparalytic stage during this epidemic are shown in Table III. (Cases 58–133). Limitation of space prevents printing of the results of muscle examination in the complete series of untreated cases; but the records of 25 of these cases are given as a sample in Table IV., together with the summation of the findings for the complete series of untreated cases.

TABLE IV.—*Untreated Cases, November, 1930, to July, 1931.*

umber in series .. 151. Deaths .. 14. Survivors .. 137.

Details of 25 cases to demonstrate grades and extent of aralysis in this group.

Case No.	Age and sex.	(1) Date of onset. (2) Date of examination.	Amount of paralysis.					
			Total.	Good.	Fair.	Poor.	Trace.	Absent
1	3 F.	12/11/30 18/7/31	101	4	24	33	20	20
2	3 F.	22/11/30 1/8/31	0	0	0	0	0	0
3	5 M.	22/11/30 30/11/30	Death.					
4	3 M.	17/11/30 1/8/31	32	12	20	0	0	0
5	8 F.	19/11/30 7/7/31	0	0	0	0	0	0
31	3 F.	16/1/31 22/7/31	9	5	4	0	0	0
32	4 F.	26/1/31 20/7/31	43	1	6	36	0	0
33	13 M.	1/1/31 23/7/31	97	3	8	24	52	10
34	3 M.	25/1/31 6/8/31	68	1	0	6	16	45
35	13 M.	1/1/31 17/1/31	Death.					
66	1½ M.	29/3/31 22/7/31	19	5	4	6	4	0
67	6 M.	27/3/31 6/8/31	379	9	6	57	92	215
68	2 M.	29/3/31 22/7/31	108	6	16	9	12	65
69	2 F.	29/3/31 28/7/31	57	4	6	30	12	5
70	2 M.	27/3/31 28/7/31	117	13	8	9	32	55
100	9 F.	18/4/31 20/7/31	21	11	10	0	0	0
101	20 F.	16/4/31 29/7/31	44	5	6	15	8	0
102	16 M.	13/4/31 22/7/31	83	4	24	42	8	5
103	12 F.	29/4/31 17/7/31	15	0	0	0	0	15
104	3 M.	1/4/31 14/8/31	2	2	0	0	0	0
134	4 F.	29/5/31 3/8/31	31	11	6	6	8	0
135	15 F.	3/5/31 2/8/31	16	9	4	3	0	0
136	3 M.	26/5/31 1/8/31	6	6	0	0	0	0
137	2 F.	4/5/31 14/8/31	24	8	4	12	0	0
138	8 M.	15/5/31 17/8/31	89	16	26	39	8	0
25 cases: 2 deaths, 23 survivors. Total paralysis			1341	135	182	327	272	435
Remaining 126 cases: 12 deaths, 114 survivors. Total paralysis			4784	990	945	1062	852	925
Total paralysis of complete series. 151 cases: 14 deaths, 137 survivors ..			6125	1125	1127	1389	1124	1360
Average paralysis per survivor ..			45·4	8·21	8·22	10 13	8 93	9 92

The comparison of degree and extent of paralysis in treated and untreated cases during the epidemic of 1930–1931 is shown in Table V.

TABLE V.—*Comparison of Treated and Untreated Cases.*

Nov., 1930, to July, 1931.	Number.	Death.	Paralysis.					
			Total.	Good.	Fair.	Poor.	Trace.	Gone.
Untreated cases	151	14	6125	1125	1127	1389	1124	1360
Treated cases	76	0	266	133	66	33	24	20
Average paralysis per survivor, November, 1930, to July, 1931—								
Untreated cases ..	137	—	45·4	8·2	8·2	10·1	8 9	9·9
Treated cases	76	—	3·5	1·7	0·8	0·4	0·3	0·2
Complete series of treated cases, 1925–1931.. ..	133	1	653	183	104	108	68	190
Average paralysis per survivor	132	—	4 9	1·39	0·78	0·8	0·5	1·42

The prognosis for ultimate recovery of function depends upon the number of muscle groups affected to the degree connoted by the standards: poor (3), trace (4), or absent (5). If all paralyses could be classified as grades (1) good, and (2) fair, poliomyelitis would lose its terror; for muscles paralysed to either of these grades achieve recovery if after-treatment be carried out. When muscles are affected to the grades trace (4) or absent (5) recovery rarely occurs; and in those paralysed to the third degree (poor) recovery necessitates years of careful after-treatment.

Table VI. compares the treated and untreated cases from this aspect of the incidence of severe paralysis with its sequelæ of permanent crippling and loss of economic independence.

TABLE VI.

—	No.	Deaths.	No. with paralysis of Grades 3, 4, and 5.	Percentage of survivors affected in Grades 3, 4, and 5.	Case No.	Grades—		
						3 Poor.	4 Trace.	5 Absent.
Treated cases	76	0	4	5·2	91 111 114 118	9 12 6 6	0 24 0 0	0 16 0 5
Untreated cases	151	14	88	58·2	Aver. per survivor	15·7	12·7	15 4

Failures.

Of the complete series treated (133), seven must be regarded as failures—No. 20 (the fatal case), and Numbers 6, 10, 41, 111, and 118. Cases 6, 10, 41, and 20 shared one common feature in their history—namely, *delay* between withdrawal of a large quantity of cerebro-spinal fluid and administration of serum. With one exception (Number 47) they are the only cases in which this delay occurred. In the others, examination of the fluid has been made forthwith and serum administered within one hour of lumbar puncture. It is suggested that the failure of these cases may be due to one or both of two factors: (1) delay, elapse of hours allowing death of cells to occur before passive immunity was induced; and (2) that the actual withdrawal of large quantities of cerebro-spinal fluid during the preparalytic stage may have actually determined involvement of the cord.[15]

Case 48 was given one injection of serum—30 c.cm. intramuscularly on the third day of her illness—and although the temperature did not fall, no second dose was given. Her paralysis confirmed the lesson taught by a small series of cases treated in Tasmania with Victorian serum, that 30 c.cm. is usually an inadequate dose. The temperature charts of Cases 111 and 118 reveal the explanation for their failures (Figs. 5 and 6).

To Case 111, through confusion with cerebro-spinal meningitis, and to Case 118, through an oversight in the rush of the epidemic, no second injection was given, though the response to the first was not satisfactory. These failures, together with the paresis, which, although clearing up rapidly and completely, could be demonstrated in 60 other treated cases, proved beyond question that of the total series of 133 cases diagnosed and treated before paralysis, 66 were actually cases of poliomyelitis. The remainder, who developed no paralysis, presented the same clinical picture as this group of 66. Moreover, no other disease developed subsequently to suggest any other diagnosis for the signs and symptoms presented.

Conclusions.

1. It has been possible to diagnose poliomyelitis as manifested in Victoria between 1925–1931 in the preparalytic stage.
2. The use of human immune serum at this stage, in adequate dosage, has given excellent results as evidenced by a low mortality-rate, a low average total paralysis, and a strikingly low proportion of paralysis of the severer grades (as has been reported in 1929 by Aycock[18]).
3. Delay between withdrawal of cerebro-spinal fluid for examination and the administration of serum is to be avoided.
4. The dosage required is variable, and a second injection should be given if the response to the first is not prompt and satisfactory.
5. It is advantageous that the serum used should be free from any substances which provoke reactions.
6. The viricidal properties of the serum available for use should be repeatedly tested by inoculation of monkeys against specimens of virus obtained in different epidemics.
7. If supplies are ample, administration of serum within 24 hours of the development of paralysis to a febrile patient is justified, and is usually followed by a fall of temperature and arrest of paralysis.
8. If given later, when paralysis is stationary, serum is of no value.
9. In the "ascending" group of cases (Landry's paralysis) the administration of serum is justifiable, but there is no certainty that the spread of paralysis will be arrested.[19]
10. Adequate after-care of all potential donors—paralysed adults and children over the age of 10—in the intervals between epidemics, and personal practical interest in their struggle for recovery is the crux of any scheme for provision of serum stocks in an emergency. By these means the store of immune human serum has been adequate to all demands of Victoria and Tasmania during the six-year period.

We acknowledge our indebtedness to the medical profession of Victoria, whose generous coöperation has made this work possible; to the Director-General of Health of the Commonwealth, Dr. J. H. L. Cumpston; to the advisory committee, Prof. Peter McCallum, Drs. C. H. Kellaway, R. Webster, F. V. Scholes, F. M. Burnet, who shared the responsibility of the earlier years; to the Poliomyelitis Committee of Victoria for financial administration; to Mr. Morrell and Miss May Kennedy, of the staff of the laboratories. We would thank the honorary medical staff of the Children's Hospital, Melbourne, for facilities granted at the hospital: the staff of the physiotherapy department and the resident medical officers for continued help in tedious detail, and especially the superintendent, Dr. Ian Jeffries Wood, for his enthusiasm and painstaking care during the epidemic of 1931.

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THE LANCET COMMISSION ON NURSING.

(Continued from p. 475.)

THE table of contents of the Final Report[1] of thi Commission, which was published in THE LANCE of Feb. 20th, showed that the extent and the natur of the shortage of candidates for the nursing profession is carefully examined in Section IV., and th main reasons for the shortage is discussed in Section V under the following headings: (*a*) The Gap betwee School and Hospital; (*b*) Pay and Prospects (*c*) Hours of Work; (*d*) Conditions of Admission an Service; (*e*) Professional Education. The reason for the shortage of trained staff are examined an discussed in Sections VI. and VII. Section VII is devoted to the staffing of non-approved hospital and Sections IX. and X. respectively to the speci difficulties of tuberculosis and mental hospitals. I Sections XI. and XII. the Commission revert t some controversial aspects of the general problen Section XI. is set out in full below.

Some Questions of Policy.

Certain proposals to which allusion has already been made[2] demand brief notice. These concern the advisability of:—

(*a*) Establishment of schools of nursing connected with universities.
(*b*) Replacement of five registers by one register.
(*c*) Substantial shortening of courses of training.
(*d*) Official recognition of two grades of nurses.
(*e*) Propaganda.

Most of these issues are outside our terms of reference. Changes as fundamental as (*a*), (*b*), (*c*), and (*d*) would involve considerations other than the relief of a shortage of candidates, and could not properly be urged solely with a view to relieving such shortage. Since, however, considerable stress has been laid on one or other of these proposals in some of the evidence submitted to us, it seems desirable to outline our reasons for making no recommendations on them.

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[1] The Report may be obtained from THE LANCET Office, 7, Adam-street, Adelphi, W.C.2, for *2s. 6d.*, post free 2s. *9d.*, or through any bookseller.

[2] See THE LANCET, Feb. 20th, p. 416.

ESTABLISHMENT OF SCHOOLS OF NURSING CONNECTED WITH UNIVERSITIES.

Nursing is essentially a craft, and as such is inseparable from the material on which it is exercised. While the endowment of schools of nursing is highly desirable (see para. 120), it can be argued that in order to maintain the practical quality which has distinguished British nursing, such schools should be attached to hospitals rather than to academic institutions of university status.

Certain members of the nursing profession specialise in branches such as administration, teaching, and dietetics, and training in such branches may be a function of a university. Diplomas in nursing for which only trained nurses are eligible are available in the universities of London and Leeds. In Leeds attendance at a three-months' course of lectures is required; in London the diploma is not an "academic" diploma—i.e., the nurse who has had the requisite experience can sit for the examination without having attended any special course. It is probable that there will be an increased demand for such diplomas in the future.

A SIMPLER FORM OF REGISTRATION.

The institution of one register with supplementary diplomas may be desirable when our hospital system is more unified, but the recruitment of nurses, particularly for the special hospitals, would not be furthered by a reorganisation of this kind at the present time. It is obvious that if a less complicated system of registration had been considered possible 12 years ago, it would have been adopted. The reasons against a simpler system which applied in 1919 are no less valid to-day. The introduction of more than one register was a measure designed to help the mental, fever, and children's hospitals to enlist probationers by offering them State recognition, and though one of these groups (mental hospitals) has taken little advantage of the opportunity offered (see para. 321), the removal of such opportunity would make it less rather than more easy for special hospitals to provide nursing care for their patients.

From the point of view of recruitment alone, it might be desirable not to abolish the Supplementary registers, but to raise the prestige of nurses on these registers by enabling them to qualify for inclusion in the General register after short additional courses. At the present time the regulations of the General Nursing Council permit nurses whose names are on any Supplementary register to be admitted to the general part of the register after only two years' training in an approved complete training school; but few such schools are willing to accept nurses on these terms, and in practice a registered mental, fever, or children's nurse usually has to start afresh as a probationer and work for three years before admission to the General register.

Widespread coöperation between different hospitals, or groups of hospitals, seems a goal unlikely to be reached in the near future for reasons quite unconnected with nursing. The fact that the voluntary hospitals of the country are separate autonomous institutions, competing with each other for support from the charitable public, and jealous of their reputations as training schools for nurses, places difficulties in the way of coöperative training. The organisation of combined training courses of reasonable length at municipal hospitals might be less formidable, since mental and fever hospitals are for the most part under Local Authorities. Few girls, however, would be willing to bind themselves to a course of training lasting for more than four years; while general hospitals would hardly agree to shorten the part of the training taken in those hospitals sufficiently to enable much time to be spent in mental, fever, or children's hospitals.

The registers are never likely to be reduced to less than three in number. The qualities and experience needed for mental nursing differ from those needed in general nursing, and a separate register for mental nurses will probably always be desirable; while a separate register for male nurses is convenient. The Supplementary parts of the register for those trained respectively in the nursing of infectious diseases and in the nursing of children come into a different category, but we do not at the present time recommend their abolition.

SUBSTANTIAL SHORTENING OF COURSES OF TRAINING

The substantial shortening of the course of training —i.e., to two years and four months—was recommended by the Rockefeller Committee in America,[3] but the proposal found little favour in that country, nor would it be likely to receive support in Great Britain. The leaders of the nursing profession in this country point to the large number of departments in which the nurse must gain experience, as a reason why no substantial shortening of the course could be contemplated. It would obviously be necessary to allocate nurse students to posts for two instead of for the usual three months in the wards and special departments, if all-round experience were to be gained, but they consider it doubtful whether a shorter experience would be sufficient to give any but the exceptional girl an insight into her duties. Those who advocate a shortened course argue that an educated woman could gain the necessary theoretical grounding, and learn nursing procedure in every branch of her work, in a shorter time than three years, provided that she was relieved of domestic work once she had become proficient in it. They hold that if the nurse is taught fundamental principles —e.g., asepsis, the avoidance of shock, the care of the skin—she should be able to apply these principles in all branches of her work without long experience in each department.

The prospect of shorter training might well attract some girls, especially those who desire ultimately to go into other branches of nursing and do not care to contemplate three years of institutional life; but there would be the disadvantage from the point of view of the hospitals that the institutions would benefit from the services of each probationer only over a shorter period. From the point of view of the rising generation of nurses the shortened training, with a bigger turnover, might bring the risk of overcrowding in the profession. There seems, however, to be little advantage in discussing in detail arguments for and against a substantial shortening of a three-year course, because though the proposal might be welcomed by prospective candidates, it is not likely to be acceptable either to the nursing profession or to the hospitals.

GRADING.

We are aware of a widespread feeling among the public and among a certain section of the medical profession that the training of a nurse at present is much too elaborate and that, at least for chronic cases, a less highly equipped attendant would serve. The recognition by registration of two grades of nurses would, it is said, bring back into the profession those who have a real vocation, but whose lack of previous education, or incapacity for book-work, unfits them to pass the examinations now required of every State-registered nurse. The opponents of grading base their arguments on its dangers to (1) the nursing profession and (2) the public. They point out that the hard-won professional status of a nurse would be endangered thereby and that her economic position would also suffer, since, in private work at least, a second-grade nurse would be likely to undercut her. In this way the introduction of grading might, it is held, prejudice recruitment of the best type of girl to the profession. The danger to the public would be that a second-grade nurse might be entrusted, through ignorance of her limitations or for economic reasons, with responsibilities which she had not been trained to fulfil, and disastrous results might ensue. The strong feeling in the nursing profession that women trained for a shorter time on a much modified syllabus should not be allowed to use the honoured title of "hospital nurse" can readily be understood. That there is room, especially in hospitals not approved for training, for attendants who could attend to the physical needs of the patients and make them comfortable under the supervision of a trained nurse, is probable. It is probable also that such attendants would be appreciated in homes where help is required with chronic invalids. But the conditions of their employment on a large scale, and the methods of safeguarding the State-registered nurse, are matters which would require much consideration.

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[3] Nursing and Nursing Education in the United States (Report of the Committee for the Study of Nursing Education), New York: The Macmillan Company, 1923, 15s., and THE LANCET, 1923, ii., 1203.

PROPAGANDA.

It has been urged upon us that some more systematic propaganda on the needs and attractions of the nursing profession is required. Evidence that the attention of girls has not been sufficiently directed to this profession has reached us from many sources. The circulation in schools of interesting and attractively printed pamphlets, the display of notices explaining the openings and methods of entering the profession, and the arrangement of visits to hospitals, would doubtless stimulate recruitment. The insertion of advertisements in journals read by girls of the age and type it is desired to enlist, the provision of lectures and the production of films illustrating the training and career of hospital nurses would also be of value.

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SCOTLAND.

(FROM OUR OWN CORRESPONDENT.)

THE GLASGOW HOSPITALS.

EACH of the three great general hospitals of Glasgow—the Royal, the Western, and the Victoria Infirmaries—reports a heavy excess of expenditure over income in 1931. On ordinary expenditure the Royal had a deficit of £24,200, the Western of £12,500, and the Victoria of over £20,000. The position of the Royal Infirmary is especially unhappy, notwithstanding that it is managed so economically that the average annual cost per occupied bed is £120 17s. 6d., as compared with the £177 spent in "one of the largest hospitals in England outside London." The in-patients are always in excess of the recognised bed state, which is a little under 800. Yet the average last year was a fraction over that figure, and the number has been as high as 870. Ordinary subscriptions and donations from employees fell by £5200, and there is no immediate prospect of improvement in this respect. The working deficiency was made up out of legacies which aggregated £47,000. As with practically every other hospital, road-accident cases helped to strain resources both in beds and money. There were 541 such cases under treatment for 8766 days at a cost of £3287, of which only £826 was recovered from the insurance companies. Among recent developments at the Royal Infirmary are a massage school for male students, and a medical gymnasium which has not only been of service to massage pupils but to the orthopædic department. It is now possible to give medical gymnastics and remedial exercises to patients in groups, instead o taking each individually. The hospital is negotiatin for a supply of radium from the Commission, but th quantity is expected to be small.

Although the Western Infirmary also worked a a loss last year its report is, on the whole, mor cheerful reading. At £70,780 its income was less b £3594, again as the result of unemployment; th expenditure was £83,300, but, taking legacies int account, receipts exceeded expenditure by nearl £7000. There is not the overcrowding which add so greatly to the difficulties of the Royal. Th average daily number of patients was 587, a little le than the bed capacity. The average stay was 17· days, and the average cost per patient £6 9s. 3 an increase of a few pence; the daily cost was 7s. 7 There was an abundant supply of aspirant prob tioners, 594 applications having been received. The new ophthalmological department is now being proceeded with; the new radiological department, which has now been at work for a full year, is of great value, and the demands upon it are continually increasing. The hospital, which is the National Radium Centre for Glasgow, is receiving an increasing number of cancer cases from most parts of Scotland, and "the results in the cases of malignant disease suitable for radiation therapy are regarded as satisfactory."

Last year the Victoria Infirmary exceeded all previous figures in the number of its in-patients, which increased by 1136 to 8616. This was partly accounted for by the 448 persons treated in the paying patients' annexe which has been fully occupied since it was opened in April last. The waiting-list for the free beds is usually about 400. There were 217 in-patients and 317 out-patients suffering from motor accidents; £600 was received from the insurance companies. The ordinary income was £51,343, and he ordinary expenditure £71,816. and after various djustments the net deficit of £14.940 was drawn rom capital account.

THE TEACHERS OF MENTAL DEFECTIVES.

The Scottish Education Department has decided o shorten the course for teachers of mentally defective hildren from six months to three months. At present the teaching is conducted at Jordanhill Training Centre, Glasgow. By rearranging and ntensifying the instruction, the National Committee or the Training of Teachers have provided a course which, it is believed, will be as effective as the longer one. The cost of the special training will thus be reduced. It will be possible to provide a larger supply of qualified teachers for the mentally defective. At present there is a shortage. The teaching of mental tests has been elaborated in very specialised ways. and careful training of the teachers is essential if their opinion of an "intelligence quotient" is to be worth anything. On the other hand. as Prof. Cyril Burt long ago pointed out, a good teacher is of more importance than the most refined tests. The fundamental problem is how to distinguish between "backward" and "defective," and once the distinction is made, how to secure them appropriate places in the industrial world. The Scottish National Committee has taken this step after extended consideration.

MATERNITY HOSPITAL DEATH-RATES.

Dr. James Young (Edinburgh), in an address on the Organisation and Administration of Maternity Hospitals, has stated that in the Glasgow Royal Maternity Hospital during 1930 there were 119 deaths in 4469 cases (26·6 per 1000), while in the Edinburgh Royal Maternity Hospital during the same year there were 36 deaths among 2305 patients (15 per 1000). He compared these results with the record of the East End Maternity Hospital in London, which had 8890 births with 10 deaths (1·1 per 1000). He pointed out that these differences were partly due to the fact that in the case of Glasgow and Edinburgh institutions there was a high concentration of abnormal and difficult maternity cases from the large areas which they served. This. however, did not explain everything, because a comparison of the same class of case showed that in the hospital in the poor quarter of London there had been 200 cases of the toxæmias of pregnancy with no deaths, whereas in Glasgow there had been 448 such cases with 22 deaths (4·9 per cent.) and in Edinburgh 17 out of 208 cases (8·1 per cent.). The same facts were revealed in regard to a comparison of other types of complications. Dr. Young pointed out that the high death-rate in the Scottish hospitals arose from factors over which they had little control. The patients arrived at the hospital with their health and chances already jeopardised. In other words, the hospitals were handicapped in so far as the cases arrived often in such a state that little could be done. The lesson to be drawn from these comparisons was that when the domestic midwifery service and the service for the supervision of pregnancy were sound, the hospital death-rate was small. When it was inferior, this death-rate was high. The inference was that there was urgent need for a revision of our maternity methods. Another fact of importance was that our central hospitals admitted patients who were "suspect" in the sense that they had suffered damage before their admission. This class of case endangered the normal healthy women, because they were so apt to be infective. To meet this risk, the modern hospital must have a system by which the two classes of cases were rigidly segregated from one another in separate buildings under a separate staff.

IRELAND.

(FROM OUR OWN CORRESPONDENTS.)

MEDICINE IN THE NEW DÁIL.

MEDICINE is represented in the new Dáil by eight members. Mr. G. Hennessy, Dr. Myles Keogh, and Dr. T. Higgins retain their seats as members of the Cumann na nGaedheal Party; Sir James Craig has again been returned as an Independent; Dr. J. Ryan and Dr. F. Ward have held their places in the Fianna Fail Party, and they have been joined by two newcomers, Dr. J. B. Lynch and Dr. F. Humphrys. Two former members of the Fianna Fail Party. Dr. P. J. O'Dowd and Dr. J. A. Tubridy, failed to secure re-election. The total number of medical men in the Dáil is therefore the same as before.

Speculation is busy as to the effect on medical affairs of the change of Government which will take place next week. It is recognised that the outgoing Government has a good record in regard to health legislation. During their ten years of office a system of public health administration has been established. and there has been radical improvement in the condition of the local hospitals. The reforms in local administration have led to increased efficiency, and the work of the Appointments Commission is gradually improving the quality of entrants to the public medical service. A good deal remains to be done, however, for Ireland still lags behind neighbouring countries in many matters concerning health. It is hoped that the incoming Government may adopt a vigorous health policy as a line of action which would cause little strenuous opposition, and therefore be safe for a Government which rests on a narrow majority to pursue. The influence of the Labour Party, which is bound to be considerable, may be relied on to be used in this direction. Already the leaders of that party are insisting that a national housing scheme must be one of the earliest activities of the new Government. It is probable that medical treatment for insured persons and the conversion of the public medical services into a national medical service will also have the support of the Labour Party.

PRESENTATION TO PROF. SINCLAIR.

In the Great Hall of the Queen's University of Belfast on Feb. 16th a tribute of affection was paid to Prof. Thomas Sinclair when he was presented with his portrait in oils, painted by Mr. George Harcourt. R.A. Viscount Bangor presided over a large company of Prof. Sinclair's medical colleagues, former pupils, and personal friends. Sir Thomas Houston. in asking the Recorder of Belfast to make the presentation, referred to the great work which Prof. Sinclair did for the Belfast Medical School during the 37 years he occupied the chair of surgery, and which entitled him to be styled the founder of modern surgery in Ulster. In presenting the portrait Judge Thompson said that hundreds of people had been eager to be associated in this permanent memorial. The portrait will hang in the Great Hall in the years to come, for Prof. Sinclair on receiving the gift presented it to the University, and it was accepted by the Vice-Chancellor as a portrait of a beloved and honoured alumnus as well as a notable work of art. It will appear in London at this year's exhibition of the Royal Academy.

UNITED STATES OF AMERICA.

(FROM OUR OWN CORRESPONDENT.)

AUTOMOBILE ACCIDENTS IN 1931.

An impressive summation of facts and figures regarding the automobile accidents of last year is presented by the Travellers Insurance Co., of Hartford, Conn., in a brochure. The growth of automobile fatalities is shown in five-year periods; 58,552 for the period ending 1921, 98,551 for the period ending 1926, 152,732 for the period ending last year, and a row of alarmingly large question marks for the period ending 1936. These deaths are then analysed in a number of interesting ways and the accidents are described and illustrated by photographs and diagrams. One excellent photograph strikingly proves how much more visible is a pedestrian facing the headlights than the same man at the same distance, but with his back to the headlights. The exercise of personal responsibility is regarded as the fundamental prerequisite to accident prevention, and these striking illustrations, one of which shows the total of deaths and injuries from automobiles last year (1,032,000) in comparison with the populations of Nevada, Delaware, Wyoming, and the District of Columbia (1,042,000), will certainly aid in promoting responsible behaviour. The brochure will be valuable alike to those who are interested in the causes of automobile accidents and those who will prize a fine example of publicity applied to a worthy cause.

UNEMPLOYMENT AND MALNUTRITION.

When inaugurating a new service of wireless health talks from Baltimore recently, Dr. W. H. Welch referred to "the unavoidable curtailment of available funds" which "places a severe strain upon efficient administration of our city health department," and added these words:

> A very important consideration in these unpredecented days of unemployment is that health and vitality are directly related to means of subsistence and standards of living, especially in the case of infants and children. Every effort should be made to guard against permanent and irremediable damage to health and strength as a legacy of the hard times through which we are passing.

All through the country we find evidence that official health authorities and voluntary organisations are awake to the dangers enunciated by Dr. Welch. An article on Emergency Nutrition by Prof. Henry C. Sherman, of Columbia University, has appeared in the *Child Health Bulletin*, has been given the advantage of partial reprinting in the *Literary Digest*, and with other information of the same kind may now be had from the American Child Health Association (450, Seventh-avenue, New York). Pamphlets have also been prepared by the Bureau of Home Economics (U.S. Department of Agriculture, Washington, D.C.), and will have wide circulation through the county agricultural agents scattered over the vast rural areas of the United States. Add to this publicity the feature stories supplied to newspapers and the special publications of the State health departments, and it is evident that an effective campaign is being waged to prevent malnutrition in the United States.

FERTILITY OF NATIVE WHITE AMERICANS.

Working for the Milbank Memorial Fund's division of research Edgar Sydenstricker,[1] the eminent statistician, writes on the fertility of native white women in a rural area of Western New York. The area includes five townships in Cattaraugus county, with a total population of about 5000, composed almost entirely of native white families of the "older native stock." To 1036 women who had been married only once and had not been permanently separated from their husbands before their forty-fifth birthday, there had been born 2959 live children. The average number of children per wife is thus 2·86. The average of course increases with age from just over one child at age 25 to an average of 3·31 for women aged 45 and over. Yet more than a quarter of the mothers in this group had born either no children at all or only one child. The average, Sydenstricker concludes, is probably sufficient to maintain the size of a relatively healthy rural population. Dividing the rural women into three groups according to the occupation of the husband—farm, labour, or business—and standardising the birth-rate for age, it was found that fertility-rates vary with occupation even in a rural community, the highest rate (2·99) being found in the farm group, and the lowest (1·89) in the business group. The size of the sample for this purpose is small, and the relative fertilities of these groups cannot be accurately gauged by the above figures. But it seems clear that there is an occupational influence. It is of interest too that this occupational difference becomes emphasised with the length of married life, and appears scarcely at all in the first three years of marriage. There is thus no indication that the business group is pressed to use contraceptive methods in early married life by economic considerations. In comparing the fertility-rates in this area for 1929–30 with those of 1910 and 1920 it is found that there has been no significant downward trend in the fertility-rate of farmers of native white stock. Is the general decline of fertility in our "older native stock" a matter not of "lessened vitality" but rather of changing environment? Such are the interesting speculations which this research has aroused.

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[1] Milbank Mem. Fund Quart. Bull., January, 1932.

MEDICAL RESEARCH COUNCIL.

ANNUAL REPORT FOR 1930–31.[1]

In presenting the Report for 1930–31 of th Committee of the Privy Council for Medical Researc Mr. Stanley Baldwin, as Lord President of Counci draws special attention to the appointment in Jul 1931, of the Agricultural Research Council. I Charter of Incorporation is closely similar to that the Medical Research Council, appointed 12 years ag and coöperation between the two bodies will be assu by the provision that they will have at least o member in common. He mentions the laws nutritional science and the methods and results which they can be elucidated, and the study disease in the animal kingdom, among the found tions on which both agriculture and medicine ba their powers.

VITAMIN D.

The Report of the Medical Research Coun records fruitful and encouraging results of the yea work. Foremost among these is placed the attai ment of accurate knowledge of vitamin D. in ter of its chemical structure and physical properties. The importance of possessing a fixed stable substance by reference to which the vitamin D activity of any foodstuff or remedy can be measured, need hardly be emphasised. A standard preparation of the parent substance, irradiated ergosterol, is already maintained at the National Institute for Medical Research for international reference. The wisdom of le provision made for the redefinition of this inter-tional unit in terms of the pure substance, when this ould be found, is now apparent; for it seems kely that the isolation of calciferol at the National stitute and the practically simultaneous isolation f the same substance (as vitamin D_2) by Prof. . Windaus and his colleagues at Copenhagen, will ulfil this condition. The story of great technical ifficulties successfully overcome by the team of nvestigators under the general leadership of Dr. R. B. ourdillon makes stimulating reading. Practical tudies undertaken to explore the possibilities of xploiting for the public benefit the known biological roperties of this vitamin are also recorded. The onfirmation by a large scale controlled investigation f the view first put forward by Mrs. May Mellanby, n experimental evidence, that the incidence of dental aries in formed teeth might be diminished by the ddition of vitamin D to the diet, is described; he results of an investigation into the effect of giving vitamin D to children whose teeth are in the course of development will be published next year, and are expected to bring out the value of the vitamin to an even more striking degree. It is clear that many dietaries regarded as adequate may not really be so.

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[1] H.M. Stat. Office. Cmd. 1008. 2s. 6d.

VIRUS DISEASES.

The chance of finding and identifying the particles of any specific virus by microscopic methods has been greatly increased by the introduction by Mr. W. J. Elford, Ph.D., of a series of graded collodion membranes for use as filters. The "filterable" viruses are so called because they can pass through porcelain and other finely porous filters that hold back ordinary bacteria; the absolute and relative dimensions of the particles of any virus can only be estimated, however, if a graded series of filters is used, with pores not only smaller than those in porcelain filters, but closely uniform in size in each grade. The use of "gradocol" filters indicates, for example, that the virus particles of infective ectromelia, a disease of mice, have a diameter of between 0·1 and 0·15 μ; the virus particles of any of the three types of foot-and-mouth disease are much more minute—being between 0·008 and 0·012 μ; a bacteriophage for the colon bacillus has a diameter of 0·02 to 0 08μ; and the limits of the filtration of the vaccinia virus through graded membranes have been determined by Dr. C. H. Andrewes and Dr. Elford with sufficient accuracy to justify an estimate that its units have a diameter of 0·125 to 0·175μ. Preliminary trials by Mr. J. E. Barnard, F.R.S., give promise of a successful demonstration of the living virus of vaccinia in ultraviolet photomicrographs.

Viruses affecting the nervous system, the virus of herpes, and the viruses of avian tumours are also being studied.

The common cold.—Reference is made to the success with which Dr. A. R. Dochez, of New York, transmitted the common cold to apes by the use of material derived from persons in the early stages of catarrh, and filtered so as to exclude bacteria. Clear evidence was obtained, and subsequently confirmed with human volunteers, that the causal agent belonged to the virus group; the virus could be cultivated outside the body, and after a series of subcultures, still produced typical catarrh in a susceptible individual. Dr. Andrewes visited this work and it is to be repeated in this country with human volunteers from among the students of St. Bartholomew's Hospital. The fact that only a brief immunity succeeds infection by this catarrhal virus unfortunately diminishes the prospect of any rapid attainment of the means of practical control.

Virus studies and cancer.—The study of the immunity reactions of the viruses producing malignant tumours in fowls has been pursued by Dr. W. E. Gye and Dr. W. J. Purdy, and correlated with the results of work on the immunity reactions of other known viruses. The evidence obtained supports the view that in these tumour filtrates we are dealing with an infective virus which is similar, as regards the immunity reactions it can elicit, to some of the acknowledged viruses causing specific diseases.

RESULTS OF INSULIN TREATMENT.

An inquiry into the results of insulin treatment at special centres is in progress. One series of over a thousand cases under treatment at one centre in the period 1925–31 is now being submitted to statistical analysis. Almost all the patients received insulin, except those cases in the highest age-group which were of the mild and slowly progressive type which can more conveniently be controlled by diet alone. The figures for young and middle-aged subjects show a great preponderance of cases where good health is maintained against all expectations based on previous experience. Moreover, the real gain is much greater than any figures can show, since these cannot measure the contrast between the full measure of bodily and mental vigour now obtained with the ever-increasing and distressing invalidism which was the lot of the diabetic in pre-insulin days.

THE RELATION OF THE COUNCIL TO MANUFACTURING FIRMS.

The Medical Research Council regard it as one of their primary functions not only to promote the stages of scientific discovery as such within the medical field, but also to facilitate the "availability" of the results of discovery in the interests of the public and the medical profession. Often much time and labour must be given before the yield of a new substance can be brought into the phase of large scale production or a new method be adapted for widespread use. Coöperation between investigation and manufacturing firms has been promoted by the Council in various ways, of which one is the organisation of the Therapeutic Trials Committee.[1] This committee works in close touch with the Chemotherapy Committee, who may be responsible for the experimental work with the drugs or preparations submitted that may be necessary or desirable before their use in man. Consultation with the Association of British Chemical Manufacturers has resulted in the formulation of agreed conditions under which new substances may be submitted for clinical study, and certain clinical trials are already in progress. The Medical Research Council regard the improved machinery for assisting the British production of new therapeutic substances as only an added phase of what has been their normal relationship to manufacturing production for many years. The Council assisted by special research the rapid development in the country of manufacturing insulin, and gave assistance by the study of methods for the production of vitamin D, various organic extracts, and material for inoculation against distemper. On the other hand the chief manufacturing firms have always been ready to offer the results of their experience, the supply of raw materials, or help in other forms. Among the names of firms mentioned in this connexion are the British Drug Houses, Lever Bros., Burroughs

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[1] See THE LANCET, 1931, ii., 301.

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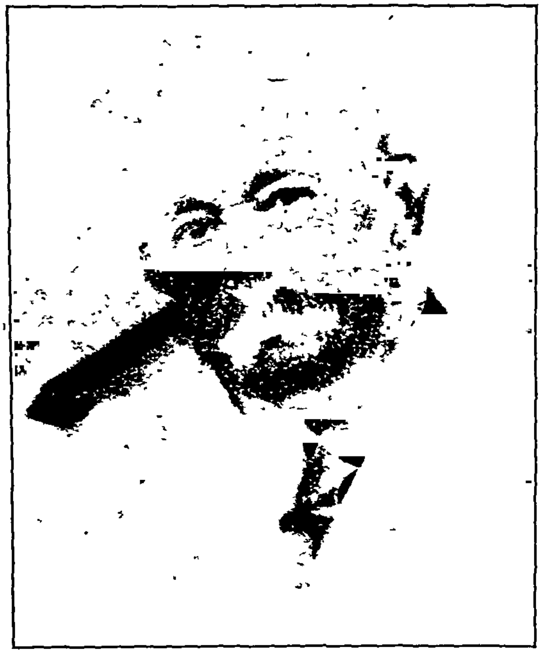
OBITUARY

SIR FREDERICK ANDREWES, M.D. Oxf., F.R.C.P. Lond., F.R.S.,

RITUS PROFESSOR OF PATHOLOGY, UNIVERSITY OF LONDON.

HE death of Sir Frederick Andrewes, briefly iounced last week, took place on Feb. 24th after hort final illness, the sequel to the cerebral attack ered in New York in 1931, from which he had de so remarkable a recovery. In fact, though had been slowly losing ground, he had kept a at deal of his regained power and was able, even late as a month ago, to enjoy a walk and talk in ie of the sunnier intervals of a London winter. 'rof. Andrewes was in the seventy-third year of his and, as he told the Abernethian Society in the ghtful reminiscences imunicated at the e of his retirement n St. Bartholomew's, was born about the e at which bacterio- y was taking its first tative steps. It was, wever, many years ore he was drawn to study of that branch science. Always an er student of nature passed from school to ist Church, Oxford, as Junior Student, and owing his scientific bent k first-class honours in school of natural nce. A year later he awarded the Burdett-itts scholarship for the dy of geology and of ural science as bearing n geology. Already he l begun his medical eer by gaining an open olarship at the medical ool of St. Bartholo- w's; in 1886 he was ted to a medical fellow-p at Pembroke College, l in 1887 proceeded to medical degree of his University. In his student s he made his first essay in bacteriology by staining l proudly exhibiting the bacillus of Koch, at that le an entirely novel procedure in clinical medicine. was not however till 1890 that the influence of in, the real Father of Bacteriology in this country, ned his serious attention to this subject. It s in Klein's laboratory, in company with a small id of enthusiasts for the new science, that Andrewes an what were to be the determining studies for his ure career. In the next seven years, although continued his bacteriological work, it appeared ely that his life would be devoted to clinical dicine. He had served the usual junior appoint-nts at his hospital, had been casualty physician, d had been elected assistant physician to the al Free Hospital. In these posts he had estab-ied a reputation for sound clinical work and able ching; his ideas were then wholly of clinical ctice and of a place on the staff. Yet when in 97 his intimate friend and forerunner, Kanthack, first lecturer on pathology at St. Bart.'s, migrated to Cambridge to become professor of pathology, Andrewes seemed to be his obvious successor. He hesitated for a little, as was natural, but (to quote his own words) realised that he loved laboratory work more than out-patients—and accepted the task. So it was at the comparatively mature age of 38 that he entered upon the work which engrossed his activities for the next 32 years. How successful that work proved is common knowledge to all St. Bart.'s men, but his reputation grew quickly outside the walls of his own school, and he soon became recognised as one of the builders of the pathological and bacteriological science which now forms so essential a partof the foundations of medicine and surgery. Rapid and striking as the change has been in the period since he was thus appointed, he still looked forward to wider developments, and quite recently in conversation sketched the future of pathological science, ever enlarging its range till it should embrace the whole activities of medical work.



SIR FREDERICK ANDREWES.

[Photograph by J Russell.

The department at St. Bart.'s to which Andrewes was appointed in 1897 at first consisted only of himself and Dr. J H. Drysdale and occupied two rooms, but in a few years it grew to comprise many other workers and assistants. His share in this development was of course part of the general rise in the importance of pathology, yet in a particular sense he did more than any other pathologist to direct growth of the new science for the somewhat devious route which he had followed to attain to a leading position in pathology had given him a wider outlook on the relationship between pathology and medical science than was, or even now is, at all common. At his own school his interest in clinical and sanitary work was maintained by his appointments as physician to the nursing staff and sanitary officer to the hospital, and it was these intermissions from the laboratory bench, among other influences, which gave him the experience and vision which enabled him to link up the advancing science with the older departments of medicine. Bacteriology naturally claimed much of his attention, but for many years he spent time in the pathological museum of the hospi[illegible] adding to that collection and [illegible] his own knowledge till he had become an acknowledged authority, not only in naked-eye but in microscopic pathology. One of his earlier papers on the histology of Hodgkin's disease, at any rate in this country entirely original work, has stood the test of time. Meanwhile his reputation was spreading in wider circles, and he was one of the first men to be appointed to the committee which later became the Medical Research Council.

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CORRESPONDENCE

TUBERCULOSIS OF CHILDHOOD.

To the Editor of THE LANCET.

—In view of the report recently issued by the
al Research Council (P. D'Arcy Hart: The
of Tuberculin Tests in Man) we feel that Dr.
Fletcher's paper in your last issue was some-
provocative in nature. While allowing for his
pt to meet expected criticism there are, surely,
who would challenge the manner in which he
lected his "normal" children. Many of the
gs at the Henry Phipps Institute (in spite of
xpenditure of time, money, and energy) have
een confirmed by workers in this country.
letcher is to be commended on his deviation
Opie and McPhedran's routine. Radiology
er is a good servant but a bad master, and we
at some at any rate of Dr. Fletcher's diagnoses,
almost solely on radiological findings, are
to serious criticism.

of Hart's main conclusions is that a child of
age, who fails to react to tuberculin, is not
ng with *tuberculosis*. whatever else may be
use of his signs or symptoms. The illustrations
of the cases. particularly in view of the remark-
short after-histories, may well be those of
pletely resolved pneumonic conditions. Such
are far from rare in tuberculosis dispensaries
dequate X ray facilities. Nor does Dr. Fletcher
on what he bases his diagnosis of "tuberculous
eo-bronchial glands" in four children, in only
f whom was a positive tuberculin test recorded.
s again was founded only on radiological evidence
y be forgiven for quoting the conclusions reached
e committee appointed by the National Tubercu-
Association of America to study the "Clinical
X ray findings in the chests of normal children":

> *he normal chest.*—The normal chest of the child from
> oentgenological standpoint is subject to such wide
> ions within normal limits as to be beyond the possibility
> ct description.
>
> *ilum shadow.*—The conglomerate shadow, commonly
> the hilum shadow, when found lying entirely within
> ner third or zone of the lung area can be disregarded
> arded as normal). except where it is made up of a solid
> of homogeneous shadow giving undoubted evidence
> t represents a growth or mediastinal pleurisy.
>
> *lcified nodes.*—Calcified nodes at the root of the lung,
> ut evidence of lung disease. are of no significance except
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E. J. MACINTYRE.

Public Health Department, Tuberculosis Dispensary,
Grange-road, Bermondsey, S.E., March 1st, 1932.

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(*Continued at foot of opposite page.*)

CORRESPONDENCE

TUBERCULOSIS OF CHILDHOOD.

To the Editor of THE LANCET.

R,—In view of the report recently issued by the cal Research Council (P. D'Arcy Hart: The e of Tuberculin Tests in Man) we feel that Dr. st Fletcher's paper in your last issue was some- provocative in nature. While allowing for his npt *to meet expected criticism there are*, surely, y who would challenge the manner in which he selected his "normal" children. Many of the ngs at the Henry Phipps Institute (in spite of expenditure of time, money, and energy) have been confirmed by workers in this country. Fletcher is to be commended on his deviation 1 Opie and McPhedran's routine. Radiology ever is a good servant but a bad master, and we that some at any rate of Dr. Fletcher's diagnoses, d almost solely on radiological findings, are i to serious criticism.

ne of Hart's main conclusions is that a child of ol age, who fails to react to tuberculin, is not ering with tuberculosis, whatever else may be cause of his signs or symptoms. The illustrations wo of the cases, particularly in view of the remark- short after-histories, may well be those of mpletely resolved pneumonic conditions. Such s are far from rare in tuberculosis dispensaries h adequate X ray facilities. Nor does Dr. Fletcher te on what he bases his diagnosis of "tuberculous cheo-bronchial glands" in four children, in only of whom was a positive tuberculin test recorded. his again was founded only on radiological evidence may be forgiven for quoting the conclusions reached the committee appointed by the National Tubercu- is Association of America to study the "Clinical d X ray findings in the chests of normal children":

> "*The normal chest.*—The normal chest of the child from roentgenological standpoint is subject to such wide iations within normal limits as to be beyond the possibility exact description.
>
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(Continued at foot of opposite page.)

le. This in itself removes the possibility of dry icles of fibre escaping into the surrounding sphere. We would add that, contrary to your mption, a minimum air pressure is maintained he fibre nozzle, and perhaps the rough sketch ched will enable you to see how full advantage been taken of the natural conditions prevailing he tunnel system.

fore this work was commenced, a very thorough stigation of our process was made by the engineers he London Underground railways, and we can re you that no pains are being spared to make thoroughly satisfactory in every respect.

We are, Sir, yours faithfully,

J. W. ROBERTS, LTD.,
Asbestos Manufacturers.

ley, Leeds, Feb. 29th, 1932.

BLOOD GROUPING OF MONGOLIAN IMBECILES.

To the Editor of THE LANCET.

R.—I am grateful to Mr. Geoffrey Keynes for ing a point which perhaps was not made clear my paper of Feb. 20th. It was certainly not my ntion to assume the existence of a linkage between ngol characters and either agglutinogen. My argument, such as it was, relied entirely on the fact that A and B are inherited as dominant characters, so that, for example, a high incidence of one of these characters among ancestors tends to produce a high incidence of this same character among the descendants. The distribution of the blood groups in the "Mongolian imbeciles," therefore, shows that among their ancestors persons belonging to populations relatively rich in B (e.g., Eastern races) have not been more frequent than among the ancestors of the individuals in the control group.

Such a conclusion, I stated, seemed inconsistent with Dr. Crookshank's views. However, in his letter, Dr. Crookshank says that my observations do not conflict with his views, and of this he is the best judge. I am sorry to have misrepresented him.

I am, Sir, yours faithfully,

L. S. PENROSE.

Colchester, Feb. 29th, 1932.

CORRECTION.—In our issue of Nov. 28th, writing from Semaphore, Australia, in reference to Darwin's naval service, Dr. F. Lucas Benham gave the name of the Captain of H.M.S. *Rattlesnake* as Owen Smyth. He should have written Owen Stanley, he informs us, a name whose familiarity is due to the fact that it has been bestowed on the highest mountain in British New Guinea.

PARLIAMENTARY INTELLIGENCE

NOTES ON CURRENT TOPICS.

DANGEROUS DRUGS—IMPORT DUTIES.

N Feb. 25th the Dangerous Drugs Bill was agreed on Report.

The Committee stage being completed, the Import ties Bill was reported to the House on Feb. 23rd, er which amendments were accepted (1) providing at scientific films should continue to enjoy the vilege conferred on them by the Act of 1928, and putting cinchona bark, cork, cork shavings, d waste cork on the free list. On Feb. 25th the ll was read the third time by 442 votes to 62—jority 380.

In the House of Lords on Feb. 29th the Import ties Bill passed through all its stages and was given e Royal Assent.

VIVISECTION AND CHEMICAL WARFARE.

On March 1st, in the House of Commons, Mr. ROVES presented a petition against the legal practice vivisection and the use of poison gas in warfare. The tition was signed by over 160,000 citizens.

SCIENTIFIC SLAUGHTER OF ANIMALS.

On March 1st, in the House of Commons, Lieut.-lonel MOORE asked leave to present a Bill to ovide for the humane and scientific slaughter of imals. He said that he introduced a similar Bill st year, but after it had passed half-way through e committee stage the national crisis supervened. he Bill sought to ensure that all animals killed for man food should be slaughtered by a mechanical strument, instead of by the present pole-axe method. f 1500 local authorities, 500 had voluntarily adopted he by-law of the Ministry of Health to this end, and many practising butchers had followed their example. he Bill was promoted by the Royal Society for the revention of Cruelty to Animals. He had decided, o avoid criticism, to withdraw pigs from the scope f the Bill. Sixteen million animals were involved early, and because of the voluntary action of certain local authorities 4,000,000 of them had been relieved of suffering.

Leave was given to introduce the Bill, and it was brought in and read a first time.

HOUSE OF COMMONS.

WEDNESDAY, FEB. 24TH.

Establishment of Naval Surgeons.

Mr. RALPH BEAUMONT asked the First Lord of the Admiralty whether the establishment of naval surgeons was complete; and, if not, what was the deficiency.—Lord STANLEY (Parliamentary Secretary to the Admiralty) replied: The establishment of naval medical officers is not complete, the deficiency at present being approximately 60.

Mr. BEAUMONT: Is it proposed to take any steps to make up that deficiency?

Lord STANLEY: Yes, the whole question of the conditions of service, recruitment, &c., in the medical branches of the three Services is under consideration by an inter-departmental committee.

Prison Administration.

Mr. GORDON MACDONALD asked the Home Secretary what action he intended to take with regard to the request made to him for the setting up of a Royal Commission to investigate and report upon the whole question of prison administration with special reference to prison industries.—Sir HERBERT SAMUEL replied: I am of opinion that the system of prison industries needs review. As I stated recently in answer to a question, a committee was appointed by my predecessor to consider the best methods of dealing with persistent offenders, and I understand that the report of that committee, which is expected to be completed in a few weeks from now, will call attention to the need for the improvement of prison industries in connexion with other proposals. When this report is received, I will consider what would be the right procedure to adopt, but, as at present advised, I do not think that the appointment of a Royal Commission would be the best means of investigating the somewhat detailed and technical questions that are involved, or would conduce to the speedy action which may prove to be desirable.

Encephalitis and Vaccination.

Mr. GROVES asked the Minister of Health how many cases of encephalitis following vaccination had been reported either direct to the Ministry of Health or through the Andrewes and Rolleston vaccination committees, from the first sitting of the Andrewes committee down to the present time; how many of these had been included in the cases admitted to be cases of injury to the nervous system resulting from vaccination; and how many fatal cases were similarly reported.—Sir E. HILTON YOUNG replied: During the period under consideration by the Andrewes Committee and the Rolleston Committee—i.e., since November, 1922—202 cases of encephalitis following vaccination have come to the notice of my department. Of these cases, 197 were;

ARTIFICIAL PNEUMOTHORAX.

To the Editor of THE LANCET.

SIR,—The note in your issue of Feb. 27th (p. 450) by Dr. J. D. Macfie and Dr. A. J. P. Alexander on the follow-up of artificial pneumothorax cases is of great interest and importance. With their assessment of the practical value of this method of treatment I am entirely in agreement, but it would be of special interest to know further details of the cases that have died, particularly as regards the mode of death. It is to be hoped that they will publish a more extended study at a later date.

It is, I think, to be regretted that more investigation has not been carried out in this country on a really large scale as to the ultimate cause of death in cases of pulmonary tuberculosis treated by artificial pneumothorax, with special reference to the spread of disease in the contralateral lung. Even now, despite all the work that has been done by different observers and the vast amount of material available for statistical purposes, we are still to a large extent ignorant of the factors which should go to form the criterion of suitability in our selection of cases for pneumothorax treatment. My impression, after some years of clinical experience, is that phthisical patients fall roughly into three groups: those that go downhill whatever treatment is employed, those that recover and achieve permanent arrest in almost any circumstances, and those that occupy a middle position, so to speak, in whom one's treatment may well be the deciding force between life and death. I am inclined to think that it is the last group which furnishes the most successful results in pneumothorax treatment. Moreover, there is, I believe, a strong impression among many who have worked at the subject that while the immediate prognosis of pulmonary tuberculosis is more favourable in A.P. cases, the ultimate outlook—i.e., as regards length of life—is better in patients in whom cure has been attempted by more natural means.

I am, Sir, yours faithfully,
MAURICE DAVIDSON.

Wimpole-street, W., Feb. 28th, 1932.

A CAMP FOR UNEMPLOYED MEN.

To the Editor of THE LANCET.

SIR,—We believe that it is within the experience of all medical men in general practice that chronic unemployment almost inevitably leads to deterioration of mental and physical health, and that this adds to the difficulty of re-entering organised industry. With unemployment as widespread as it is now, the progressive inefficiency in the community from this cause becomes a menace not only to the happiness of millions, but to our communal ability to take the initiative if opportunities present themselves for a revival of trade, and to our capacity for reorganising our social structure if progressive rationalisation of industry demands it.

We are closely associated with a group of social workers known as the Order of Woodcraft Chivalry, which has set on foot a scheme of national non-military service. This has been devised so as to give opportunity to all young men who have either voluntary or involuntary leisure, to devote it to a full-time camp course of training, directed to the maintenance of physical fitness, mental alertness, initiative, and citizenship.

We are not yet ready to undertake the regeneration of demoralised men, though we hope to be so soon. Our first pioneer group, which will go into camp in March, must grow at first by the addition of men of courage, initiative, and vision, capable of building up a tradition of hardihood and mutual help; and the purpose of this letter is to ask that the names and addresses of such men—great numbers of whom must be known to your readers—may be sent to the hon. secretary at 2, Devonshire-place, W.1. They should be between the ages of 18 and 25. If they ar entitled to unemployment or transitional benefits the Ministry of Labour has agreed that these may b paid over for their maintenace while under training.

We shall be very glad to supply full information t anyone interested.

We are, Sir, yours faithfully,
(Sgd.) I. NORMAN GLAISTER, D. L. TUCKER,
E. SCHOFIELD, R. TURNER,
B. STANLEY, A. WESTLAKE.
F. TALBOT,

2, Devonshire-place, W., Feb. 27th, 1932.

ASBESTOS IN LONDON TUBE RAILWAYS.

To the Editor of THE LANCET.

SIR,—With reference to the annotation on page 41 of your issue of Feb. 20th, we, as inventors of th process referred to, give you herewith a few particulars, which we trust will enable you to arrive at better conception of the work which is at preser being carried out in the London Underground tunnel Particular attention is drawn by you to the Hom Office inquiry into the effects of asbestos dust on th lungs, and it will be seen that ventilation and th replacement, wherever possible, of dry processes wet, form the basis of the safeguards recommende of which advantage has been taken by the designe of our apparatus.

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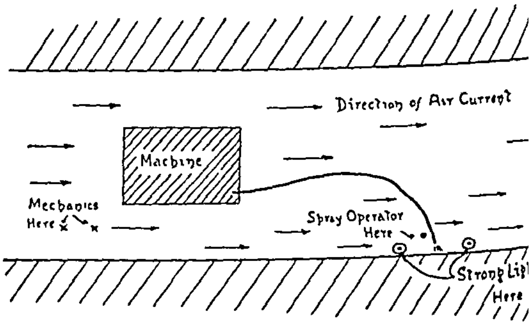

In addition, a special study has been made of question of suitable adhesives, so that suffic liquid can be used through the second projecto completely saturate the fibre delivered from the o

e. This in itself removes the possibility of dry les of fibre escaping into the surrounding sphere. We would add that, contrary to your ption, a minimum air pressure is maintained e fibre nozzle, and perhaps the rough sketch hed will enable you to see how full advantage een taken of the natural conditions prevailing e tunnel system.

fore this work was commenced, a very thorough igation of our process was made by the engineers e London Underground railways, and we can e you that no pains are being spared to make thoroughly satisfactory in every respect.

We are, Sir, yours faithfully,

J. W. ROBERTS, LTD.,
ey, Leeds, Feb. 29th, 1932. Asbestos Manufacturers.

BLOOD GROUPING OF MONGOLIAN IMBECILES.

To the Editor of THE LANCET.

R.—I am grateful to Mr. Geoffrey Keynes for ng a point which perhaps was not made clear y paper of Feb. 20th. It was certainly not my tion to assume the existence of a linkage between gol characters and either agglutinogen. My argument, such as it was, relied entirely on the fact that A and B are inherited as dominant characters, so that, for example, a high incidence of one of these characters among ancestors tends to produce a high incidence of this same character among the descendants. The distribution of the blood groups in the "Mongolian imbeciles," therefore, shows that among their ancestors persons belonging to populations relatively rich in B (e.g., Eastern races) have not been more frequent than among the ancestors of the individuals in the control group.

Such a conclusion, I stated, seemed inconsistent with Dr. Crookshank's views. However, in his letter, Dr. Crookshank says that my observations do not conflict with his views, and of this he is the best judge. I am sorry to have misrepresented him.

I am, Sir, yours faithfully,

Colchester, Feb. 29th, 1932. L. S. PENROSE.

CORRECTION.—In our issue of Nov. 28th, writing from Semaphore, Australia, in reference to Darwin's naval service, Dr. F. Lucas Benham gave the name of the Captain of H.M.S. *Rattlesnake* as Owen Smyth. He should have written Owen Stanley, he informs us, a name whose familiarity is due to the fact that it has been bestowed on the highest mountain in British New Guinea.

PARLIAMENTARY INTELLIGENCE

NOTES ON CURRENT TOPICS.

DANGEROUS DRUGS—IMPORT DUTIES.

N Feb. 25th the Dangerous Drugs Bill was agreed n Report.

he Committee stage being completed, the Import ies Bill was reported to the House on Feb. 23rd, n which amendments were accepted (1) providing t scientific films should continue to enjoy the vilege conferred on them by the Act of 1928, and putting cinchona bark, cork, cork shavings, d waste cork on the free list. On Feb. 25th the l was read the third time by 442 votes to 62—jority 380.

In the House of Lords on Feb. 29th the Import ties Bill passed through all its stages and was given e Royal Assent.

VIVISECTION AND CHEMICAL WARFARE.

On March 1st, in the House of Commons, Mr. oves presented a petition against the legal practice vivisection and the use of poison gas in warfare. The tition was signed by over 160,000 citizens.

SCIENTIFIC SLAUGHTER OF ANIMALS.

On March 1st, in the House of Commons, Lieut.-lonel MOORE asked leave to present a Bill to ovide for the humane and scientific slaughter of imals. He said that he introduced a similar Bill st year, but after it had passed half-way through e committee stage the national crisis supervened. he Bill sought to ensure that all animals killed for man food should be slaughtered by a mechanical strument, instead of by the present pole-axe method. f 1500 local authorities, 500 had voluntarily adopted e by-law of the Ministry of Health to this end, and any practising butchers had followed their example. he Bill was promoted by the Royal Society for the revention of Cruelty to Animals. He had decided, o avoid criticism, to withdraw pigs from the scope f the Bill. Sixteen million animals were involved early, and because of the voluntary action of certain cal authorities 4,000,000 of them had been relieved of suffering.

Leave was given to introduce the Bill, and it was brought in and read a first time.

HOUSE OF COMMONS.

WEDNESDAY, FEB. 24TH.

Establishment of Naval Surgeons.

Mr. RALPH BEAUMONT asked the First Lord of the Admiralty whether the establishment of naval surgeons was complete; and, if not, what was the deficiency.—Lord STANLEY (Parliamentary Secretary to the Admiralty) replied: The establishment of naval medical officers is not complete, the deficiency at present being approximately 60.

Mr. BEAUMONT: Is it proposed to take any steps to make up that deficiency?

Lord STANLEY: Yes, the whole question of the conditions of service, recruitment, &c., in the medical branches of the three Services is under consideration by an interdepartmental committee.

Prison Administration.

Mr. GORDON MACDONALD asked the Home Secretary what action he intended to take with regard to the request made to him for the setting up of a Royal Commission to investigate and report upon the whole question of prison administration with special reference to prison industries.—Sir HERBERT SAMUEL replied: I am of opinion that the system of prison industries needs review. As I stated recently in answer to a question, a committee was appointed by my predecessor to consider the best methods of dealing with persistent offenders, and I understand that the report of that committee, which is expected to be completed in a few weeks from now, will call attention to the need for the improvement of prison industries in connexion with other proposals. When this report is received, I will consider what would be the right procedure to adopt, but, as at present advised, I do not think that the appointment of a Royal Commission would be the best means of investigating the somewhat detailed and technical questions that are involved, or would conduce to the speedy action which may prove to be desirable.

Encephalitis and Vaccination.

Mr. GROVES asked the Minister of Health how many cases of encephalitis following vaccination had been reported either direct to the Ministry of Health or through the Andrewes and Rolleston vaccination committees, from the first sitting of the Andrewes committee down to the present time; how many of these had been included in the cases admitted to be cases of injury to the nervous system resulting from vaccination; and how many fatal cases were similarly reported.—Sir E. HILTON YOUNG replied: During the period under consideration by the Andrewes Committee and the Rolleston Committee—i.e., since November, 1922—202 cases of encephalitis following vaccination have come to the notice of my department. Of these cases, 197 were;

ARTIFICIAL PNEUMOTHORAX.

To the Editor of THE LANCET.

SIR,—The note in your issue of Feb. 27th (p. 450) by Dr. J. D. Macfie and Dr. A. J. P. Alexander on the follow-up of artificial pneumothorax cases is of great interest and importance. With their assessment of the practical value of this method of treatment I am entirely in agreement, but it would be of special interest to know further details of the cases that have died, particularly as regards the mode of death. It is to be hoped that they will publish a more extended study at a later date.

It is, I think, to be regretted that more investigation has not been carried out in this country on a really large scale as to the ultimate cause of death in cases of pulmonary tuberculosis treated by artificial pneumothorax, with special reference to the spread of disease in the contralateral lung. Even now, despite all the work that has been done by different observers and the vast amount of material available for statistical purposes, we are still to a large extent *ignorant of the factors which should go to form the* criterion of suitability in our selection of cases for pneumothorax treatment. My impression, after some years of clinical experience, is that phthisical patients fall roughly into three groups: those that go downhill whatever treatment is employed, those that recover and achieve permanent arrest in almost any circumstances, and those that occupy a middle position, so to speak, in whom one's treatment may well be the deciding force between life and death. I am inclined to think that it is the last group which furnishes the most successful results in pneumothorax treatment. Moreover, there is, I believe, a strong impression among many who have worked at the subject that while the immediate prognosis of pulmonary tuberculosis is more favourable in A.P. cases, the ultimate outlook—i.e., as regards length of life—is better in patients in whom cure has been attempted by more natural means.

I am, Sir, yours faithfully,
MAURICE DAVIDSON.

Wimpole-street, W., Feb. 28th, 1932.

A CAMP FOR UNEMPLOYED MEN.

To the Editor of THE LANCET.

SIR,—We believe that it is within the experience of all medical men in general practice that chronic unemployment almost inevitably leads to deterioration of mental and physical health, and that this adds to the difficulty of re-entering organised industry. With unemployment as widespread as it is now, the progressive inefficiency in the community from this cause becomes a menace not only to the happiness of millions, but to our communal ability to take the initiative if opportunities present themselves for a revival of trade, and to our capacity for reorganising our social structure if progressive rationalisation of industry demands it.

We are closely associated with a group of social workers known as the Order of Woodcraft Chivalry, which has set on foot a scheme of national non-military service. This has been devised so as to give opportunity to all young men who have either voluntary or involuntary leisure, to devote it to a full-time camp course of training, directed to the maintenance of physical fitness, mental alertness, initiative, and citizenship.

We are not yet ready to undertake the regeneration of demoralised men, though we hope to be so soon. Our first pioneer group, which will go into camp March, must grow at first by the addition of men courage, initiative, and vision, capable of building up a tradition of hardihood and mutual help; and the purpose of this letter is to ask that the names and addresses of such men—great numbers of whom must be known to your readers—may be sent to the hon. secretary at 2, Devonshire-place, W.1. They should be between the ages of 18 and 25. If they ar entitled to unemployment or transitional benefits the Ministry of Labour has agreed that these may b paid over for their maintenace while under training.

We shall be very glad to supply full information t anyone interested.

We are, Sir, yours faithfully,
(Sgd.) I. NORMAN GLAISTER, D. L. TUCKER,
E. SCHOFIELD, R. TURNER,
B. STANLEY, A. WESTLAKE.
F. TALBOT,

2, Devonshire-place, W., Feb. 27th, 1932.

ASBESTOS IN LONDON TUBE RAILWAYS.

To the Editor of THE LANCET.

SIR,—With reference to the annotation on page 4 of your issue of Feb. 20th, we, as inventors of t process referred to, give you herewith a few part culars, which we trust will enable you to arrive at better conception of the work which is at prese being carried out in the London Underground tunne Particular attention is drawn by you to the Ho Office inquiry into the effects of asbestos dust on t lungs, and it will be seen that ventilation and t replacement, wherever possible, of dry processes wet, form the basis of the safeguards recommend of which advantage has been taken by the design of our apparatus.

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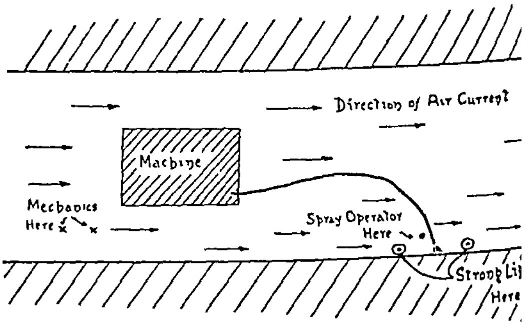

In addition, a special study has been made of question of suitable adhesives, so that suffi liquid can be used through the second projecto completely saturate the fibre delivered from the c

MEDICAL NEWS

ety of Apothecaries of London.

ent examinations the following candidates were sful:—

ry.—A. Kobylsker and W. W. Perry, Guy's Hosp.
ery.—R. R. Chapman, St. Mary's Hosp.; B. Duval, of Durham; W. Hertzog, Guy's Hosp.; J. L. F. King, ng Cross Hosp.; M. S. Myles, Royal Free Hosp.; C. F. ing Cross Hosp.; G. W. Sturgess, St. Bart.'s ; F. A. Trembleday and C. F. Verey, St. Mary's Hosp.; G. Yencoll, Guy's Hosp.
nce Medicine.—G. A. Duncan and W. S. Pitt Payne, Hosp., and L. R. C. Rose, Univ. of Manchester.
ifery.—G. W. Aston, Univ. of Birmingham; L. A. Univ. of Sheffield; and W. Hertzog and A. Kobylsker, Guy's Hosp.

following candidates, having completed the final examination, have been granted the Diploma of the Society entitling to practise medicine, surgery, and midwifery: R. R. W. W. Perry, W. Hertzog, G. W. Sturgess, J. L. F. and C. F. Verey.

al Society of Arts.

r. J. C. Drummond, D.Sc., professor of biochemistry, the University of London, will give three lectures on nt Researches on the Nature and Function of Vitamins. the house of the Royal Society of Arts, John-street, London, W.C., on Mondays, April 18th and 25th, May 2nd at 8 P.M.

gress on Biliary Lithiasis.

n International Congress on Biliary Lithiasis will be d at Vichy from Sept. 19th to 22nd. The principal s of discussion will be the Sequelæ of Cholecystectomy, dical and Hydro-mineral Treatment of Cholecystitis ary Lithiasis, and the Cholelithiatic Liver. Inquiries ld be addressed to the secretary-general of the Congress, Boulevard des Capucines, Paris.

ntal Deficiency and Allied Conditions.

course of lectures for medical practitioners on Mental ciency and other Mental Conditions Closely Allied to it, be held at the University of London, Imperial Institute d, South Kensington, London, S.W., from April 11th d supplemented by a course of clinical instruction. e lecturers will include Dr. A. F. Tredgold, Dr. F. C. hell, Prof. Cyril Burt, Dr. W. Rees Thomas, Dr. am Moodie, and Dr. Emanuel Miller. Further ticulars may be had from Miss Evelyn Fox, c/o University ension Dept., at the above address.

fred Fripp Memorial Fellowship.

On Feb. 26th, at University College, Mr. Stanley Baldwin ed the first of the 20 annual lectures on Happiness d Success, for which Sir Alfred Fripp left a legacy. After ture Lord Goschen, the chairman, handed over to the s of Guy's Hospital the trust deeds of the Alfred p Fellowship, which has been founded to promote ch in the psychology of children. Election to the wship will be by a board of electors consisting of the ician for diseases of children, the superintendent and dean of the medical school of Guy's Hospital as ex-officio ers, and of five Members coöpted by them. The p Fellow will be allowed opportunities of study in the ren's department of the hospital, and candidates must ualified men or women, unmarried, and not more than years of age. The stipend will be £300 per annum, and Fellowship is to be regarded as a whole-time appointment, though it may be held concurrently with a onstratorship. It will be held ordinarily for two years.

Bacteriological Investigation of Puerperal Sepsis.

By arrangement between the Ministry of Health and the ical Research Council, Dr. Dora Colebrook, has been inted by the Medical Research Council to work in the laboratories of Queen Charlotte's Hospital, Hammersmith, where a number of agglutinating sera are available typing puerperal strains of streptococci. Her appointment gives effect to a recommendation of the Departmental mittee on Maternal Mortality, that combined epidemiological and bacteriological investigation should be more undertaken, with a view to defining the responsibility he throat "carrier" and to investigating the rôle played other infective conditions in persons in contact with the nt. Dr. Colebrook's time will be fully occupied with al typing. Medical officers of health are invited to communicate directly with Dr. Colebrook in the event of n outbreak, and to send swabs from the cervix uteri or per vagina, and from tonsils and nose of the patient and the contacts. By this means it is hoped to determine the demiological nature of the infection and to trace its rce.

Naval Medical Compassionate Fund.

A meeting of the subscribers of this fund will be held at 3 P.M. on March 31st at the Medical Department of the Navy, Archway Block N., Admiralty, London, S.W. 1, to elect six directors of the fund.

Eugenics Society.

At a meeting of this society, to be held at 8.30 P.M. on Tuesday, March 15th, at the rooms of the Linnean Society, Burlington House, Piccadilly, W., Mr. J. Myles Bickerton will speak on Eugenics and Blindness.

Royal Statistical Society.

The *Frances Wood Memorial Prize*, value £30, is offered this year for the best investigation, on statistical lines, of any problem affecting the economic or social conditions of the wage-earning classes. Particulars may be had from the hon. secretaries of the Royal Statistical Society, 9, Adelphi-terrace, London, W.C. 2.

History of Pædiatrics.

Dr. G. F. Still will give a lecture on the Medical Care of the Child through the Ages, at 3 P.M. on Tuesday March 15th, at 31, Belgrave-square, London, S.W. The lecture will be in aid of King's College Hospital, and particulars will be found in our advertisement columns.

Course on Disorders of Digestion.

A course on the medical and hydrological treatment of diseases of the digestive tract, the liver, and of nutrition, will be held from April 18th to May 2nd at the Hôpital Necker, Paris, under the direction of Prof. Maurice Villaret. It will include a study tour to Vichy from April 30th onwards. Particulars may be had from the Laboratoire d'Hydrologie of the Faculté de Médecine de Paris (École pratique).

A Reduced Maternity Death-rate.

At Glasgow Royal Maternity and Women's Hospital last year the maternity death-rate was 2 per cent., as against 2·6 per cent. in the previous year. The number of abnormal cases was 62 per cent. of all admissions; in the previous year the percentage was 70

A Summer School of Individual Psychology.

The Individual Psychology Association will hold a summer school this year at Semmering, a beautiful pass in the mountains about two hours' railway journey from Vienna. The meeting will take place from June 26th to July 10th, and can be attended by English people at a reasonable cost, as the Association can obtain concessions in respect of quarters and fares for the congressists. Prospectuses and further information can be obtained from the Secretary, Mrs. Sofie Lazarsfeld, Sollergasse 16, Vienna, I.

London Fever Hospital.

At the annual meeting of this hospital recently Lord Ebury, the president, stated that there was a deficit of £2337 on the year's working, and that failure to obtain a good response to a renewed appeal "will inevitably mean closing this institution, which for 130 years has done such wonderful work, and is still necessary to the life of this great city."

Southport Hydropathic Hospital.

In 1931 the patients admitted numbered 433, of whom nearly 300 came under the general heading of rheumatism. Most of them were able to return home to resume their normal avocations. The next largest group of patients, numbering 120, were suffering from affections of the nervous system. In the great majority of sciatic cases relief has been secured promptly, and in many has been retained permanently.

British Health Resorts Association.

This newly formed association will hold a regional conference at Hastings during the coming week-end. After a banquet on Friday night, the proceedings will open on Saturday morning with a meeting at which Dr. W. G. Willoughby, president of the British Medical Association, will take the chair, and the speakers will include Dr. E. P. Poulton, Dr. R. A. Young, Dr. Leonard Findlay, Dr. Wilfred Harris, Dr. G. R. Bruce, Dr. Percy Lewis, Dr. J. R. Dingley, and Dr. Thomas Read. At a second meeting later in the day Lord Meston will preside, and brief addresses will be given, among others, by Lieut.-Colonel R. H. Elliot, Mr. Clough Williams-Ellis, and Dr. Fortescue Fox. Proposals will be made for the formation of a local branch of the association. On Sunday visits will be paid to Eastbourne, Bexhill and other resorts in the area. The address of the hon. secretary of the association is 6, Elsworthy-road, London, N.W.3.

as the result of inquiry, regarded as cases of post-vaccinal encephalitis, and 102 proved fatal. In the remaining five cases, of which two died, there appeared to be no reason to associate the encephalitis with the antecedent vaccination.

THURSDAY, FEB. 25TH.

Mental Deficients and Paternity Cases.

Sir JOHN HASLAM asked the Home Secretary whether his attention had been drawn to a recent paternity case tried at the Bolton county police-court, wherein a man who acknowledged his responsibility escaped his liability, because the justices had to dismiss the application owing to the claimant being of too weak an intellect to understand the nature of an oath; and whether he would introduce, at an early date, legislation to remedy that state of things.—Sir HERBERT SAMUEL replied: This case is most exceptional and probably unique. The complainant appears to have been of insufficient capacity to understand the nature of an oath or of the proceedings, and it would cause injustice if an order could be made against a man denying paternity without the evidence of the mother. In this case the man is reported to have been willing to admit paternity and, if so, the right course to pursue would be to invite him to enter into an enforceable agreement for the payment of maintenance to the mother.

Medical Benefit Regulations.

Dr. HILLMAN asked the Minister of Health whether, seeing that he had decided not to proceed with the proposed redraft of parts of the medical benefit regulations dealing with fee-charging, and that the Insurance Acts Committee of the British Medical Association acquiesced in this decision, he would take the opportunity of making it clear that there was no connexion between the proposed redraft and the deduction from insurance doctors' remuneration made as an emergency economy last October.—Sir E. HILTON YOUNG replied: I am glad to have an opportunity of repeating what I indicated in reply to a question on this subject by my hon. friend on Dec. 3rd, that the proposal to redraft the relevant parts of the regulations was initiated by the department in September, 1930, and was therefore entirely unconnected with the proposals for securing emergency economies in the cost of medical benefit which became necessary a year later.

Mr. RHYS DAVIES: Will the right hon. gentleman tell the House why the proposed draft has been dropped?

Sir E. HILTON YOUNG: It was dropped because it was considered not to be necessary.

Sanatorium Treatment of Tuberculosis.

Mr. DAVID GRENFELL asked the Minister of Health if he would give the most recent figures showing the result of treatment of tuberculous patients at sanatoriums in the United Kingdom, with the number of patients admitted, the number who were passed out as cured, and the number where treatment was unsuccessful.—Sir E. HILTON YOUNG replied: The following are the figures in respect of England and Wales: The number of persons admitted for the treatment of tuberculosis to approved residential institutions in England and Wales in the year 1930 was 44,517. The number of persons discharged in the same year from such institutions with their disease quiescent was 9410. The number who died in the institutions in the same year was 5073. A person who has suffered from tuberculosis is not considered to be cured of the disease until it has been quiescent for five years if it is pulmonary, or for three years if it is non-pulmonary. It is not therefore usually possible to say at the date of discharge from an institution whether the treatment has been permanently successful.

Milk and Butter-fat Standard.

Mr. GLOSSOP asked the Minister of Health whether in view of the fact that under the existing law milk might be sold containing less than 3 per cent. butter-fat, Government standard, provided that the farmer could prove that such milk was as it came from the cow, he would consider the revision of the law in this matter.

Brigadier-General CLIFTON BROWN asked the Minister of Health whether, seeing that the law did not require that milk shall contain any particular percentage of fat, and that it was not an offence to sell milk containing less than 3 per cent. of fat, he would alter the sale of milk regulations which lay down that milk containing less than 3 per cent. of fat was presumed to be adulterated until the contrary was proved; and whether he would put the onus of proof on the prosecutor as was the case in other similar regulations.—Sir E. HILTON YOUNG replied: I have received representations with regard to the amendment of the law in the directions suggested, and will consider the matter in consultation with my right hon. friend, the Minister of Agriculture and Fisheries.

Labelling of Imported Meat.

Mr. HURD asked the Minister of Agriculture what mea were taken to lead local authorities to enforce the distin labelling of imported meat in the shops, as required by th Sale of Food Order, 1921; and whether he was aware of th laxity of some authorities in this matter.—Sir Jo GILMOUR replied: As my hon. friend is no doubt aware, th Sale of Food Order of 1921 has now been revoked with th exception of the provisions relating to meat. This porti of the Order has been continued in force from year to ye under the Expiring Laws Continuance Act. Power enforce the provisions lies with the local authorities, a I have no power to compel them in the matter.

TUESDAY, MARCH 1ST.

Poison Gas Experiments on Animals.

Mr. GROVES asked the Financial Secretary to the War Of the reason why no reports had been issued on the work of chemical warfare medical committee since 1920 on question of poison gas experiments on animals; and wh accounts of the experiments performed during the last years and their results might be obtained.—Mr. D COOPER (Financial Secretary to the War Office) repli This committee was dissolved in 1919 and research on problems has been continued by the Chemical Defe Committee. Information as to the number of experime performed is given in the Home Office returns of exp ments on living animals of which the last issue was d July 29th, 1931.

Blindness and Insanity Due to War Service.

Mr. MCGOVERN asked the Secretary of State for the number of persons who were blinded and driven in as a result of service in the late war, and the numbers lost either an arm or a leg or both arms or both legs.—M TRYON (Minister of Pensions) replied: The approxi numbers of pensions in the categories mentioned at the of 1931 were as follows: Cases of total blindness, of mental disorder in mental hospitals, 6300; and cas amputation of a leg or arm, or of both arms or both 34,500.

Appointments

Certifying Surgeons under the Factory and Workshop ARNOTT, D., M.B., Ch.B. Edin. (Shaftesbury); SEARS, L.R.C.P. Lond., M.R.C.S. (Lyndhurst); and WORSLE (Malvern).

Births, Marriages, and Deat

BIRTHS.

HUBBLE.—On Feb. 24th, the wife of Douglas Hubble, M. Kedleston-road, Derby, of a daughter.

MCCURRICH.—On Feb. 23rd, at Palmeira-avenue, Hov wife of H. J. McCurrich, M.S., F.R.C.S., of a son (still

SWINDELL.—On Feb. 25th, at Westwood-road, Southam the wife of Dr. R. S. Swindell, of a daughter.

DEATHS.

ANDREWES.—On Feb. 24th, at Windy Gap, Merton-lane, gate, Sir Frederick William Andrewes, M.D., F.R.S., 73rd year.

APPERLY.—On Feb. 24th, suddenly of pneumonia, at Chas Kingswood, Surrey, Herbert Apperly, L.D.S. R.C.S

CATHCART.—On Feb. 22nd, at a nursing home, Edinb Charles W. Cathcart, F.R.C.S. Eng. and Edin Newbattle-terrace, Edinburgh.

GARDNER.—On Feb. 27th, at Imberway, Warminster. W Gardner, M.R.C.S., L.R.C.P., in his 75th year.

VAN GEYZEL.—On Feb. 20th, suddenly, at Hotel Beau Cannes, John Lawrence Van Geyzel, C.I.E., Colonel (retired), aged 74.

N.B.—A fee of 7s. 6d. is charged for the insertion of Noti Births, Marriages, and Deaths.

QUEEN'S INSTITUTE OF DISTRICT NURSI Princess Alice, Countess of Athlone, last week pres long service badges to "Queen's" superintendents nurses who have completed 21 years' service. Sinc last meeting of the council 32 associations have been affi and the names of 405 nurses have been placed on th of Queen's nurses. At the end of last year there deficit, and had it not been for the large sum raised b gardens scheme "the institution would have been with a very serious financial crisis."

NOTES, COMMENTS, AND ABSTRACTS

YOUTH AND THE CINEMA.

IE cinema makes its impression essentially upon eye, and the majority of people have a more itive memory for what they see than for what hear. Again, while the cinema affects people ll ages and all classes, it makes a particularly ig appeal to children and adolescents. Sir les Grant Robertson, speaking from the chair he National Conference on Problems connected the Cinema, held at the University of Birming- on Feb. 27th, said that within his lifetime four t developments of science—motor-cars, films, tion, and the wireless—had fundamentally altered lives of ordinary men and women. In his opinion most revolutionary of the four was the cinema, yet it was the only one left entirely without ernment control in this country. Sir Charles he made a practice of attending the cinema in company of young people, and he could not pe a sense of misgiving at the thought of a dy infiltration into their subconsciousness of the l of representation and criticism of life shown the films. Lady Barrett, M.D., emphasised this it when she quoted the answer of many children he time of the Birmingham inquiry as to what y learned from the pictures—"We learn what is really like." Everybody would agree, she l, that it was not a good thing for children, who no background with which to compare what y saw, to be introduced to an unworthy view of and to form the opinion that normal life was that. Lady Barrett dealt with the question of ental responsibility, and made an analogy with powers of a food controller. A mother might h to give her children food which was cheap and ich did not appear to her harmful, but a food troller would confiscate it because he understood danger of ptomaine poisoning. The average ther could not be expected to be an expert in chology any more than in toxicology, and we had much right to protect our children from poisoned nds as from poisoned bodies. Miss Cottell (Bristol), president of the National Union of Women achers, reminded the Conference that we have used to allow parents unlimited responsibility in ler matters, such as whether their children shall end school, or whether they shall engage in street iding, and there was reason to believe that children quired some protection in the matter of attendance films. As a teacher, she found that children's licacy of taste was vitiated by over-sensationalism d over-sentimentality of the cinema. Mr. J. wat Fraser, M.P., in his work among young delin- ients, had found undoubted evidence that the nema encouraged a tendency to youthful offences. r. W. A. Potts pleaded for improvement of the nema in the interest of adolescent boys and girls. e attended the pictures regularly once a week to e for himself the effect of the films on the minds l young people. As a medical practitioner, as a sychologist, and as a father, he felt bound to protest gainst scenes which appeared to be staged with a eliberate intention to stimulate the sex instinct. ife at the threshold of manhood and womanhood as difficult enough without adding to the burden temptation.

Throughout the day a large amount of evidence as forthcoming as to a widespread dissatisfaction ith the conduct of the cinema, and a real desire or its amendment. Only one resolution was on the genda, and after much discussion it was passed in the following form: "That this Conference submits that a comprehensive inquiry into the arrangements by which films are licensed for public exhibition is urgently called for, and asks the Home Secretary to receive a deputation on this subject."

THE SCIENCE OF MEDICINE.

THE author of this book, whose full title is "The Science of Medicine: How Chronic Diseases are Cured Medicinally by Raphael Roche,"[1] informs us that he has received great commendation in the lay press, that he has made communications himself to that press on the science of medicine, and that the book is submitted as the fruit of over half a century of practice. He deprecates estimates of his medicinal cures, if formed on the fact that he employs (in his own words) "drugs in such an extreme dilution that no analysis, chemical or spectroscopic, will discover their existence"; but from instructed therapeutists he must expect such criticism. He refers to "the emphasis I lay on unusual symptoms, which may sound like affectation"; the instructed physician or surgeon knows that the unusual symptom is often the revealing one and could never find fault with the intention to detect it though he might wonder whence the diagnostic skill is derived. Attention is drawn on the cover to the fact that the work contains a full statement by Mr. Bernard Shaw of his medicinal cure by the author; the instructed doctor will here find some odd logic. The author and Mr. Reginald Dingle, who is thanked for his help in writing the book, have produced an indictment which will give pleasure to all who are "agin the doctor," and which may attract the public to the consulting room of Mr. Roche, whose fees we learn from himself, "are so much higher than those of any legally qualified physician." Of *how* diseases are cured there is nothing intelligible said; but there are allusions to Vital Force.

PSYCHOLOGY IN INDUSTRY.

IT is gratifying in these days to learn of one industrial body that has experienced no decline in its activities. The eleventh report of the National Institute of Industrial Psychology describes 32 investigations in factories, shops, and offices. Whereas in the past attention has chiefly been centred on problems of production, it seems probable that the future may see the same intense thought and activity applied to problems of distribution; the selection and training of salesmen, the display of goods, market research, and sales organisation. As examples of the Institute's work may be cited a demonstration of the superiority of hand-packing over conveyor packing in a chocolate factory, whereby a saving of £2000 a year was effected; and the reorganisation planned for a patent flour factory which will save £3700 a year on an initial outlay of £7000. Further investigations have been carried out for the Post Office; tests have been devised for phonogram and teleprinter candidates; and various forms, previously misunderstood by many recipients, have been redrafted to save correspondence and explanation. During 1931 the Institute enrolled 284 new members and received more than 7000 visitors, including the Prince of Wales. Public demonstrations are given on the last Wednesday in each month, and on at least one Saturday morning, when films are shown and methods demonstrated. The Journal has become so popular that it is to appear monthly instead of quarterly, under the title of *The Human Factor*, and early in 1932 a popular survey ("Industrial Psychology in Practice") and a history of the Institute ("Ten Years of Industrial Psychology") are to be published.

The vocational guidance department advised 500 young people during the year under review, and the cases examined in 1927 and 1928 have been followed up by a questionaire. Of 90 people working in accordance or apparently in accordance with the Institute's advice, 76 were found to be successful

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[1] By Raphael Roche. London: C. W. Daniel Company. 1932. Pp. 159. 5s. net.

Medical Diary

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

TUESDAY, March 8th.—5 P.M., THERAPEUTICS AND PHARMACOLOGY. *Paper*: Dr. G. H. Oriel: Some Observations on the Treatment of Allergic Disease. A discussion will follow which will be opened by Prof. van Leeuwen. 8.30 P.M., PSYCHIATRY. *Paper*: Dr. J. Ernest Nicole: Some Sources c

WEDNESDAY.—5 P.M
TOLOGY. Dis
Mr. Ernest Mi
Mummery and others.

THURSDAY.—8.30 P.M., UROLOGY: OBSTETRICS AND GYNÆCOLOGY. Discussion: Frequency of Micturition in Women. *Openers*: Mr. G. E. Neligan and Mr. Victor Bonney.

FRIDAY.—5.30 P.M., CLINICAL. (Cases at 4.30 P.M.) Cases: Mr. Cecil P. G. Wakeley: 1. Temporal Meningocele. Dr. Parsons Smith: 2. Monckeberg's Sclerosis. Dr. Bernard Myers: 3 and 4. Thrombocytopenic Purpura. Dr. Terence East: 5. Familial Acholuric Jaundice. Dr. J. L. Livingstone: 6. Leukæmia. Mr. A. J. Watson: 7. Elephantiasis. Dr. F. Parkes Weber: 8. Erythræmia. Dr. Dorothy Hare: 9. Episcleritis and Arthritis Following Diathermy Treatment of Tonsils. Other cases will be shown. 5 P.M., OPHTHALMOLOGY. Clinical Meeting at the London Hospital, E. Cases will be shown.

MEDICAL SOCIETY OF LONDON, 11, Chandos-street,

h.—9 P.M., Mr. F. A. Williamson-Noble:
of the Eye to General Disease. (Second Lettsomian lecture.)

HARLEY MEDICAL SOCIETY, 149, Harley-street, W.

THURSDAY, March 10th.—9 P.M., Inaugural Meeting. Mr. P. Lockhart-Mummery: The Origin of Tumours. To be followed by a discussion.

SOUTH-WEST LONDON MEDICAL SOCIETY.

WEDNESDAY, March 9th.—9 P.M. (at Bolingbroke Hospital, Wandsworth Common), Dr. W. J. O'Donovan: Pruritus

WEST KENT MEDICO-CHIRURGICAL SOCIETY.

FRIDAY, March 11th.—8.45 P.M. (at the Miller General Hospital, Greenwich, S.E.), Mr. T. M. Thomas: Some Surgical Emergencies of Childhood.

MEDICAL SOCIETY OF INDIVIDUAL PSYCHOLOGY, Chandos-street, Cavendish-square, W.

THURSDAY, March 10th.—8.30 P.M., Dr. Bevan-Brown: A Case of Dissociation—for Discussion.

PADDINGTON MEDICAL SOCIETY.

TUESDAY, March 8th.—9 P.M. (at the Great Western Royal Hotel, Paddington, W.), Dr. Alfred Cox: Forty Years' Experience of Medical Organisation and its Results.

BIOCHEMICAL SOCIETY.

FRIDAY, March 11th.—3
Gower-street, W.C.).
and G. N. Greenwoc
Insulin.
A Crystall . 3. N. K.
Adam, J. and G. F.
Marrian:)erivatives.
4. E. Boy Compounds
in Tumoı Accurate
Titration of "Free HCl" of Gastric Contents, Peptic Digests, &c. 6. K. Culhane: The Importance of the Basal Diet for Vitamin A Tests. 7. K. Culhane: The Influence of Light White Casein in the Onset of Xerophthalmia.

ROYAL INSTITUTION, 21, Albemarle-street, W.

THURSDAY, March 10th.—5.15 P.M., Prof. J. B. S. Haldane: Heredity in Man.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF PHYSICIANS, Pall Mall East, S.W.

TUESDAY, March 8th.—5 P.M., Dr. L. J. Witts: Pathology and Treatment of Anæmia. (Last Goulstonian lecture.)

THURSDAY.—5 P.M., Dr. C. E. Lakin: The Borderlands of Medicine. (First Lumleian lecture.)

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, Marcl MEDICAL
SOCIETY OI vendish-
square. omerville
Hastings Open to
Members o Mon.
and Fri., at Hospital,
Out-patien Five
demonstra Wed.
at 8.30 P. e room,
lecture by Dr. H nificance
and Measuremer Thurs. at
8.30 P.M., at 10, ecture by Dr.
A. Knyvett Goı Pathology of
Septicæmia, illustrated by Epidiascope, followed by a Laboratory Demonstration. Open to Members only.—WEST END HOSPITAL FOR NERVOUS DISEASES, 73, Welbeck-street, W. Lecture demonstrations daily at 5 P.M.—BETHLEM ROYAL HOSPITAL, Monks Orchard, Eden Park, Beckenham. Tues. and Fri at 11 A.M., lecture demonstration in psychological medicine.—ROYAL WATERLOO HOSPITAL, Waterloo road, S.E. Course in Medicine, Surgery, and Gynæcology, all day.—ROYAL NATIONAL ORTHOPÆDIC HOSPITAL, Great Portland-street, W. Special post graduate course in Orthopædics. All day. (Abon
courses o
Medicine.
Demonstr.
Tues. at 2.30 P.M.

UNIVERSITY COLLEGE HOSPITAL MEDICAL SCHOOL University-street, W.C.

TUESDAY, March 8th.—5.15 P.M., Prof. C. C. Okell: Anaphylaxis.

FRIDAY.—5 P.M., Prof. C. R. Harington: Nature of th Secretion of the Thyroid Gland (Sydney Ring Lecture).

LONDON SCHOOL OF DERMATOLOGY, St. John's Hospita 49, Leicester-square, W.C.

TUESDAY, March 8th.—5 P.M., Dr. H. T. Barron: Comm Eruptions in Childhood.

THURSDAY.—5 P.M., Dr. J. E. M. Wigley: Pemphigus a Allied Eruptions.

NATIONAL HOSPITAL, Queen-square, W.C.

MONDAY, March 7th.—2 P.M., Dr. Riddoch: Out-pati Clinic. 3.30 P.M., Dr. Hinds Howell: Trauma Relation to Nervous Disorders.

TUESDAY.—2 P.M., Dr. Walshe: Out-patient Cli 3.30 P.M., Dr. Adie: Neurosyphilis.

WEDNESDAY.—2 P.M., Dr. Martin: Out-patient Cl

THURSDAY.—2 P.M., Dr. Kinnier Wilson: Out-pati Clinic. 3.30 P.M., Mr. Just: Demonstration Methods of Testing the Eighth Nerve. (In Electr Department.)

FRIDAY.—2 P.M., Dr. A Clinic. 3.30
Dr. James Collier:

CHARING CROSS HOSPI

SUNDAY, March 6th.—10.45 A.M., Dr. H. G. E. Willi Indications and Technique of Version in Obste 11.45 P.M., Dr. J. E. M. Wigley: Infantile Ecz

GUY'S HOSPITAL, London Bridge, S.E.

MONDAY, March 7th.—5 P.M., Dr. A. F. Hurst: U X Rays in Physiological Investigations.

ROYAL NORTHERN HOSPITAL, Holloway-road, N.

WEDNESDAY, March 9th.—3.15 P.M. (at the Royal Hospital), Dr. N. Schuster: Demonstration of P logical Specimens.

KING'S COLLEGE HOSPITAL MEDICAL SCH Denmark-hill, S.E.

THURSDAY, March 10th.—9 P.M., Dr. Graham Hod Portable Radiology.

SOUTH-WEST LONDON POST-GRADUATE ASS TION, St. James' Hospital, Ouseley-road, Balham.

WEDNESDAY, March 9th.—4 P.M., Mr. Stanley Sterility.

ST. MARK'S HOSPITAL, City-road, E.C.

THURSDAY, March 10th.—4.30 P.M., Mr. J. K. H Low Spinal Anæsthesia.

ST. PETER'S HOSPITAL, Henrietta-street, W.C.

WEDNESDAY, March 9th.—3 P.M., Dr. C. Dukes: Tu of the Upper Urinary Tract.

CENTRAL LONDON THROAT, NOSE, AND EAR PITAL, Gray's Inn-road, W.C.

FRIDAY, March 11th.—4 P.M., Mr. W. A. Mill: Lary

HAMPSTEAD GENERAL AND NORTH-WEST LO HOSPITAL.

WEDNESDAY, March 9th.—4 P.M., Mr. A. Sorsby Ophthalmoscope in Cardiovascular Disease.

SALFORD ROYAL HOSPITAL.

THURSDAY, Marcy 10th.—Dr. H. T. Ashby: Demons of Diseases of Children.

NATIONAL COUNCIL FOR MENTAL HYGIENE.

WEDNESDAY, March 9th.—5.30 P.M. (at 11, Chandos W.), Miss S. M. Fry: A Magistrate's Proble Psychologists.

MANCHESTER ROYAL INFIRMARY.

TUESDAY, March 8th.—4.15 P.M., Mr. E. W. T Dystrophies of Growing Bone.

FRIDAY.—4.15 P.M., Dr. T. H. Oliver: Demonstra Medical Cases.

ANCOATS HOSPITAL, Manchester.

THURSDAY, March 10th.—4.15 P.M., Mr. H. Platt Common Affections of the Hip-joint.

ST. MARY'S HOSPITALS, Manchester.

FRIDAY, March 11th.—4.15 P.M. (at the Whitwort West Hospital): Dr. Bramwell: The Treatm Heart Disease in Pregnancy.

WESTERN INFIRMARY, Glasgow.

WEDNESDAY, March 9th.—4.15 P.M., Dr. J. G. Ma Robertson: Venereal Diseases (Male).

ADDRESSES AND ORIGINAL ARTICLES

THE PATHOLOGY AND TREATMENT OF ANÆMIA.

BY L. J. WITTS, M.D. MANCH., F.R.C.P. LOND.,
ASSISTANT PHYSICIAN TO GUY'S HOSPITAL; WILL EDMONDS CLINICAL RESEARCH FELLOW.

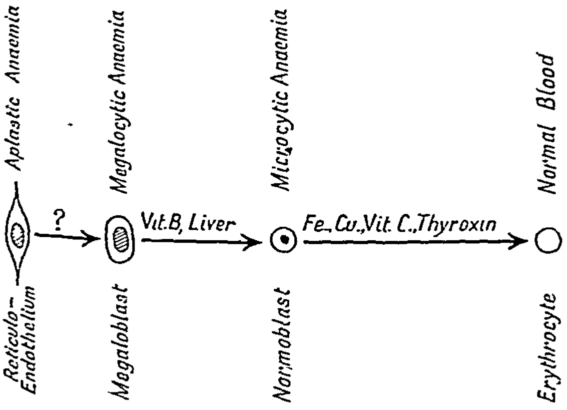
LECTURE II.

THE ANHÆMOPOIETIC ANÆMIAS.*

> "The volume of blood depends on the quantity of nutriment dissolved and absorbed by the digestive tract."
>
> SAMUEL FENWICK, "Atrophy of the Stomach," 1880.

IN this second lecture I propose to discuss the anæmias which result from disturbances of nutrition and disorders of the alimentary tract. They form a group which impresses both by its size and its unity. It is my opinion that all are of nutritional origin. The normal human diet contains substances which are necessary for the maturation of megaloblast into normoblast, such as vitamin B and the active principle of liver, and others which are necessary for the maturation of normoblast into erythrocyte, such as vitamin C, thyroxin, iron, and traces of other minerals. Animal experiments [16] suggest that food substances are also necessary for the development of the megaloblasts from the reticulo-endothelium of the marrow, and that their absence leads to aplasia. Anæmia arises whether these substances are not supplied with the diet or whether they are not absorbed in digestion.

FIG. 1.



Scheme of anhæmopoietic anæmias showing point of action of the substances essential for blood formation.

The anæmia is due to diminished blood formation or anhæmopoiesis, and according to the level at which hæmopoiesis is arrested, the marrow may be normoblastic, megaloblastic, or aplastic. The cells drafted into the circulation from this dysplastic marrow are sometimes abnormal and liable to early destruction, but hæmolysis is always secondary to the degeneration of the bone-marrow, and is never of high degree. The reticulocyte count is low, the resistance to hypotonic saline is little impaired, and hæmoglobinæmia and hæmoglobinuria never occur. The white cells and the platelets are normal or diminished. Remission of the disease is attended by an outpouring of reticulocytes in numbers directly proportional to the extent of the hyperplasia of the bone-marrow. All these features are in direct contrast to the hæmolytic anæmias, which will be described in the next lecture. Clinically these anæmias are characterised by their frequent association with glossitis, gastro-intestinal disorders, and degeneration of the nervous system.

Some of these anæmias are simple and uncomplicated: the nutritional anæmia of infancy is entirely due to shortage of minerals in the milk, and the anæmia of scurvy to shortage of vitamin C. In others the effects of one deficiency predominate in the blood picture, but traces of other defects may be recognised, as when iron deficiency occurs in Addison's anæmia,[5] or of the liver principle in simple achlorhydric anæmia.[14] In other cases, again, the symptoms of multiple deficiency may be present together, as in the anæmia of pellagra or in tropical macrocytic anæmia. The blood picture may change during the evolution of the primary disease. Megalocytic anæmia is very constant in Addison's anæmia, but it is not uncommon for the disease to begin as a microcytic anæmia, and more rarely it terminates in aplasia. This sequence of events is almost the rule in sprue.

Anæmia from Defective Nutrition.

The divisions I have made of this group of nutritional and alimentary anæmias are for convenience of presentation, for it is clear that nutritional defects may lead to disease of the alimentary tract, and that alimentary disease may lead to ingestion of an imperfect diet, either from appetite or from prescription. For brevity I shall use the terms hypochromic, orthochromic, and hyperchromic for anæmias in which the colour-index is below unity, unity, and above unity respectively.

Nutritional anæmia of infants.—Anæmia of moderate degree is present in practically all infants, whether fed by the breast or artificially. It may become very severe, especially in twins and premature babies, who come into the world with a small store of iron, or after intercurrent infection, or when suckling is protracted beyond the normal period. It disappears spontaneously on the adoption of a mixed diet. Helen Mackay has made a comprehensive and illuminating study of this anæmia, which appears to be a pure mineral deficiency, resultant from the low iron and mineral content of the milk and reparable by inorganic salts of iron.

The anæmia of scurvy.—Mettier and co-workers have recently discussed the anæmia of scurvy and have shown that severe hypochromic anæmia is often present in cases where no bleeding has occurred. The bone-marrow is moderately hyperplastic. The anæmia does not respond to iron, or to liver extract which has been deprived of its vitamin C (though still effective in pernicious anæmia), but there is a prompt response of reticulocytes and rapid regeneration of the blood on administering foods which are rich in vitamin C. They suggest that when vitamin C has been chronically deficient its replenishment promotes the development of the nucleated erythrocytes, and so permits a reticulocyte response and repair of the anæmia.

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* The second Goulstonian Lecture for 1932, delivered before the Royal College of Physicians of London on March 3rd. Lecture I. appeared last week.

and only eight definitely unsuccessful. Of 44 who did not seem to have taken the advice, 17 were successful and 17 unsuccessful, with ten doubtful. This department is also working among Borstal lads. A great deal of research is being done in the vocational department as well as along more general lines. The work of secretaries and nurses is being analysed; the nature and measurement of the mental abilities involved in factory assembly operations have been investigated; experiments in typewriting have shown the great importance of rhythm in developing speed; and occupational conditions among the blind have been studied. More and more the Institute is making itself an essential and integral part of the industrial life of the nation.

INCUNABULA IN THE R.C.S. LIBRARY.

Mr. W. R. le Fanu, librarian to the Royal College of Surgeons of England, has compiled a list of the Incunabula in the College library [1] containing over fifty valuable items, but the experienced reader's eye will linger over three or four jewels. There is Benevenuto Grassi's De Oculis, 1474, recently translated by Casey A. Wood; John of Gaddesden's Rosa Anglica; Petrus de Abano's Conciliator differentiarum philosophorum et medicorum, &c., 1476; and Michael Scotus's Liber Physionomiæ, 1490. Osler wrote of Michael Scot as one of the greatest thirteenth century scholars, with whose observations on the temperaments and on the significance of dreams in persons of different complexions Freud and the modern advocates of incubation sleep would sympathise. It might be hoped that some day the breath of life which animates the museum below might stir the library to demonstrate its treasures to a wider circle.

TREATMENT OF RHEUMATOID ARTHRITIS.

We are informed by the Anglo-French Drug Co., Ltd. (238A, Gray's Inn-road, London, W.C.), that they hold stocks of Allochrysine, the gold compound mentioned by Dr. Jacques Forestier in his paper on rheumatoid arthritis in our last issue.

Vacancies

For further information refer to the advertisement columns.

Aberdeen City District Asylum, Newmachar.—Jun. Asst. P. £300.

Abergavenny, Monmouthshire Mental Hospital.—Jun. Asst. M.O. £350.

Ascot, Heatherwood Hospital for Orthopædic Children.—Res. Med. Supt. £850.

Aylesbury, Royal Buckinghamshire Hospital.—Res. M.O. £200.

Barnstaple, North Devon Infirmary.—Res. M.O. At rate of £150.

Beit Memorial Fellowships for Medical Research.—Jun. Fellows. Each £400.

Bradford, Royal Eye and Ear Hospital.—Jun. H.S. £150.

Bradford Royal Infirmary.—H.S. At rate of £135.

Bristol Eye Hospital.—Hon. Asst. Surgeon. Also Asst. Res. H.S. £100.

Canterbury, Kent and Canterbury Hospital.—H.P. At rate of £125.

Cardiff City.—Asst. M.O. £500.

Cardiff City Mental Hospital, Whitchurch.—Clin. Asst. and Research Student. £200.

Cardiff, Welsh National School of Medicine.—Jun. Asst. in Medical Unit. £250.

Chester, East Lanchashire Tuberculosis Colony, Barrowmore Hall, Gt. Barrow.—H.P. At rate of £100.

Coventry and Warwickshire Hospital.—Res. H.P. and H.S. £160 and £125 respectively.

Derby, Derbyshire Hospital for Women, Friar Gate.—H.S. At rate of £150.

Doncaster Royal Infirmary.—Sen. Cas. H.S. At rate of £175.

Dover, Royal Victoria Hospital.—H.S. £150.

Durham County Hospital.—Two H.S.'s. Each £150.

East Ham Memorial Hospital, Shrewsbury-road, E.—H.P. and H.S. and Cas. O. At rate of £150 and £120 respectively.

Golden-square Throat, Nose, and Ear Hospital, W.—Hon. Anæsthetist.

Great Barrow, Nr. Chester, East Lancs., Tuberculosis Colony.—Asst. M.O. At rate of £275.

Greenwich, Dreadnought Hospital.—H.P. and H.S. Each at rate of £110.

Grocers' Company, Grocers' Hall, E.C.—Research Scholarships. Each £300.

Halifax, St. Luke's Hospital.—Sen. Res. M.O. £350.

Hampstead General and N.W. London Hospital, Haverstock *N.W.*—Cas. Surg. O. for Out-patient Dept. At rate of £100

Harrogate Infirmary.—Sen. H.S. At rate of £150.

Hereford, Herefordshire General Hospital.—Hon. Anæsthetist.

Hertford County Hospital.—H.S. At rate of £200.

Hospital for Consumption and Diseases of the Chest, Brompton *S.W.*—Whole-time Research Worker. £350. Also Med Reg. £200.

Hospital for Sick Children, Great Ormond-street, W.C.—Cas. O £400.

Hospital for Tropical Diseases, Endsleigh-gardens, W.C.—H. At rate of £150.

Ilford, King George Hospital.—Cas. H.S. At rate of £100.

Infants Hospital, Vincent-square, Westminster.—H.P. At rate £75.

Ipswich, East Suffolk and Ipswich Hospital.—H.S. and H. Each £120.

Isleworth, West Middlesex County Hospital.—Res. Asst. M. £400.

Lancaster County Mental Hospital.—Asst. M.O. £500.

Leeds, St. James's Hospital.—H.P. At rate of £150.

Liverpool, County Mental Hospital, Rainhill.—Asst. M.O. £5

Liverpool, David Le[illegible] Hon. Asst. Sur

London Homœopathic [illegible] —Phy

London Hospital, E.-

Macclesfield General Infirmary.—Sen. and second H.S.'s. rate of £180 and £150 respectively.

Manchester Babies' Hospital, Burrage-lane, Levenshulme.—J Res. M.O. At rate of £50.

Manchester, Royal Children's Hospital, Pendlebury.—Res. M. At rate of £125.

Manchester, Royal Children's Hospital, Gartside-street.—T Asst. M.O.'s. Each at rate of £150.

Manchester Royal Infirmary.—Med. Reg. to Out-patients. rate of £150.

Manchester and Salford Hospital for Skin Diseases.—Asst. M. £100.

Margate, Royal Sea Bathing Hospital.—Asst. Med. Supt. £5

Miller General Hospital, Greenwich-road, S.E.—Anæstheti 52 gns. Also H.P. £100.

Northampton General Hospital.—H.P. and three H.S.'s. Ea at rate of £150.

Norwich, Norfolk and Norwich Hospital.—H.P. £120.

Nottingham and Midland Eye Infirmary.—Res. H.S. £200.

Parbold, Lancs, Wrightington Hospital.—Jun. Asst. M.O. £2

Portsmouth Royal Hospital.—H.S. At rate of £130.

Princess Louise Kensington Hospital for Children, St. Quent avenue, N. Kensington, W.—H.P. At rate of £75.

Queen's Hospital for Children, Hackney-road, E.—H.P. a Cas. O. Each at rate of £100. Also Surgeon to Ear, No and Throat Dept.

Royal Dental Hospital of London, 32, Leicester-square, W.C Asst. Dental Surgeon. Also House Anæsthetist for In- a Out-patient Department. 10s. 6d. per session.

Royal National Orthopædic Hospital, 234, Gt. Portland-street, H.S. At rate of £150. Also 2 H.S.'s for Country Bra Brockley Hill, Stanmore. Each at rate of £150.

Royal Northern Hospital, Holloway, N.—Res. M.O. £200. H.S. At rate of £70.

St. Alfege's Hospital, 48, Vanbrugh Hill, Greenwich, S.E.— Asst. M.O. £350.

St. Bartholomew's Hospital.—Dental H.S. £80.

St. Helens County Borough.—Deputy M.O.H. £700.

St. Leonards-on-Sea, Buchanan Hospital.—Jun. H.S. At of £125.

St. Peter's Hospital for Stone, &c., Henrietta-street, Covent Ga W.C.—H.S. At rate of £75.

Salford Royal Hospital.—Res. H.S.'s to Special Depts. at rate of £125.

Scarborough Hospital and Dispensary.—Two H.S.'s. Eac rate of £175.

Southampton, Royal South Hants and Southampton Hospit Hon. Asst. Surg.

Stafford, Staffordshire General Infirmary.—H.P. At rat £150.

Stoke-on-Trent, North Staffordshire Royal Infirmary.—O pædic H.S. £150.

Surrey County Mental Hospital Service.—Jun. Asst. M.O.

Swanley, Kent, Hospital Convalescent Home, Parkwood.— M.O. At rate of £200.

Taunton, Taunton and Somerset Hospital.—Sen. House and H.S. £150 and £100 respectively.

Wakefield Clayton Hospital.—Two Jun. H.S.'s. Each at ra £150.

Walsall, General Hospital.—H.P. and Res. Pathologist and Each at rate of £150.

Warwick, King Edward VII. Memorial Sanatorium, Her Hill.—Jun. M.O. At rate of £200.

West London Hospital, Hammersmith-road, W.—H.P. and H. H.S. to Ear, Nose, and Throat Dept., and Res. Anæ tist. Each at rate of £100. Also Hon. Med. Radiolog

Wigan, Royal Albert Edward Infirmary and Dispensary.—T H.S.'s. Each at rate of £150.

Willesden General Hospital, N.W.—Cas. O. At rate of Also H.S. and H.P. At rate of £110 and £100 respecti

York Dispensary.—Res. M.O. £175.

The Chief [illegible] unces vacant appoint
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Cree[illegible] Cranbrook (Kent),
Troon (Ayr).

The Secretary of State for the Home Department gives n of vacancies for medical referees under the Workn Compensation Act for the Bishops Castle, Bridgn Llanfyllin, Ludlow, Madeley, Oswestry, Shrews Wellington, Welshpool, and Whitchurch County Districts. Applications should reach the Private Secre Home Office, Whitehall, London, S.W., not later March 23rd.

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[1] Reprint from Annals of Medical History, N.S. vol. ii., pp. 674–76.

why the blood picture may be normal in patients with achlorhydria, while a megalocytic anæmia may develop in patients with hydrochloric acid in the gastric secretion.

The mere absence of acid seems to play little part n the development of glossitis, megalocytic anæmia, or subacute combined degeneration of the cord. Physiologists[10] have long been sceptical of the antiseptic action attributed to the gastric juice, on which depended the theory that pernicious anæmia was due o hæmolysis by toxins elaborated by organisms in he alimentary tract, and much clinical evidence is at variance with this theory. To the hæmatologist he chief function of the gastric hydrochloric acid is o dissolve the mineral elements of the diet, while he ferments are infinitely more important in Addionian anæmia. It is conceivable that bacteria and parasites in the alimentary canal may destroy the hæmatinic principles of the food by their metabolic activities, and so indirectly influence the erythron. When we consider the intestinal diseases, we shall see that the secretion of hydrochloric acid by the stomach may be normal in cases where we have most reason to suspect this process, and we shall see that t often happens that the intestinal disease starts first and achlorhydria develops later. Intestinal infection cannot account for the fact that predigested liver is ten times as effective as raw liver in pernicious anæmia.[50] The natural conclusion from the evidence is that pernicious anæmia is the result of impaired gastric digestion and the consequent impoverishment of the plasma in the building stones for erythropoiesis.

Yet the gastrogenous theory of pernicious anæmia cannot be accepted without qualification. It is true that pernicious anæmia has developed in so many patients after operations on the stomach that we hardly need to postulate any inborn weakness of the hæmopoietic system for its development. Nevertheless, good health may be maintained for years without a stomach. In experimental animals removal of the whole stomach produces no glossitis, stomatitis, or nervous symptoms; anæmia occurs rarely, it is of the secondary type, and it is usually attributable to some additional strain such as pregnancy or diarrhœa.[31] Few human patients survive a complete resection of the stomach for very long, as the operation is seldom performed except for carcinoma, and death from metastasis occurs within two years. Of the 34 cases collected by Uhlhorn in 1927 only four were known to have survived longer than two years, and only one longer than four years. Nevertheless, all had lived some weeks or months after the operation, and there was only one doubtful instance of pernicious anæmia in the whole series (Moynihan's case, which was probably not pernicious anæmia [30]). When pernicious anæmia develops after subtotal gastrectomy, the interval of time is often more than five years, and it has been as long as 16 years.

It seems as if the human organism, like the animal, can compensate over long periods for the absence of the stomach. The final breakdown may be due to exhaustion of the hæmatinic reserves, the growth of an abnormal intestinal flora, or the failure of intestinal digestion. Those who cling to the old theory of intestinal infection in pernicious anæmia may think that the deciding factor is the intestinal flora, but when we consider the frequency of megalocytic anæmia in fatty diarrhœa and after intestinal resection, we shall probably conclude that it is a matter of the efficiency of digestion and assimilation in the intestine. While the results of gastrectomy show that a healthy intestine can compensate for the failure or absence of the stomach, there is evidence on the other hand that disorders of the intestine may nullify the effects of perfect digestion in the stomach. We seem driven to the view that in pernicious anæmia either gastric or intestinal digestion, or both, may be at fault.

Barnett has described an atypical case of pernicious anæmia, in which it seemed probable that intestinal absorption was at fault. The blood was typical of Addison's anæmia, but there was a good secretion of free HCl by the stomach. The anæmia responded to liver treatment. Nevertheless, Barnett was able to show that the gastric juice contained the "intrinsic factor" by carefully controlled experiments, in which another patient with pernicious anæmia was treated with beef muscle predigested in the juice.

Before leaving the subject of pernicious anæmia we may mention several points in which it differs from other megalocytic anæmias. These are: (1) the primitive character of the megaloblasts sometimes present; (2) the high degree of bilirubinæmia, bilirubin excretion, and hæmosiderosis; (3) the hypersegmentation of the polymorphonuclear cells. Much has been made of these differences by some hæmatologists, but the accumulation of knowledge has convinced the majority that the changes in pernicious anæmia shade indefinitely into those of other megalocytic anæmias. It is characteristic of pernicious anæmia that nutrition is well maintained. Apart from the subacute combined degeneration of the spinal cord, there is a pure and uncomplicated absence of the hæmatinic principle necessary for the maturation of megaloblasts into normoblasts. We should therefore expect in pernicious anæmia the most striking effects of megaloblastic degeneration of the bone-marrow, uncomplicated by the disturbances of the general health and of the iron and pigment metabolism, which accompany other alimentary and nutritional diseases. It is for this reason that the bilirubin excretion is so much higher and the megaloblasts so primitive. As regards the bone-marrow it may be noted that a thorough examination always reveals some areas of complete aplasia, though the majority of the bones contain hyperplastic marrow.

Simple Achlorhydric Anæmia and Allied Anæmias.

The new work on pernicious anæmia and its specific treatment with liver has caused a revival of interest in a form of anæmia in many ways related to pernicious anæmia, but differing from it in its unresponsiveness to liver and its curability by iron.[72] In this anæmia, which occurs almost exclusively in women, the colour-index is low and van den Bergh's reaction negative. It resembles pernicious anæmia in its association with achlorhydria—80 per cent. of my large series of cases—splenomegaly, and glossitis. It differs from it in the absence of degenerative changes in the spinal cord and in the presence in some cases of dysphagia, due to a backward spread of the inflammation of the mouth and tongue to the pharynx, a phenomenon rare in pernicious anæmia, though well known in tropical nutritional anæmia, sprue, and pellagra. Not a great deal is known of the morbid anatomy, but there appears to be a moderate normoblastic hyperplasia of the bone-marrow, a simple hyperplasia of the spleen, and no change in the other organs. The red cells are usually smaller than normal, and very deficient in hæmoglobin. Treatment with iron salts repairs the anæmia, and the red cells return to their normal size and hæmoglobin content.

TROPICAL NUTRITIONAL ANÆMIA.

Apart from the anæmia of infants fed on milk alone, defective diet is rarely responsible for anæmia in the temperate zones, though Minot[46] and others[34] have reported cases of anæmia of a megalocytic type which appeared to be due to prolonged restriction of diet, and which responded to treatment with liver. It is far otherwise in the tropical and subtropical zones, and in India, Africa, and China, a large fraction of the population maintains life on diets which are incredibly poor by western standards and which contain insufficient material for normal erythropoiesis. They are lacking in total calories, in protein, especially animal protein, in vitamins, and in mineral salts. Wills and co-workers have shown that the level of the blood count in various classes in India is directly proportional to the level of nutrition, and that malaria, hookworms, and similar anæmising influences can be ruled out of question in many instances. The anæmia is referable to dietetic defects alone, and it is often associated with skeletal deformities and œdema of a nutritional type. It is more common in women than men, and it may be hypochromic, orthochromic, or hyperchromic.

A striking feature of the anæmia is its tendency to assume a profound degree and a megalocytic type in pregnancy, though other influences may produce a similar aggravation, in men as in women. Indeed, the common occurrence of severe and often fatal megalocytic anæmia in pregnancy in Indian women first attracted attention to these anæmias. Medical advice is rarely sought before the last months of pregnancy when the patient is already profoundly anæmic. Fever, diarrhœa, and vomiting are marked symptoms, and the disease is more common in the second half of the year when diarrhœa is common. The tongue may be sore, and occasionally burning sensations pass down the fauces. The test-meal is normal, and there are no cord changes. The average red cell count is below a million, the mean diameter of the cells is increased, the colour-index well above unity. There is no jaundice or hyperbilirubinæmia, reticulocytes and nucleated red cells are infrequent, and normoblasts are more common than megaloblasts. The white cells are normal. If no treatment is given death occurs in about 40 per cent. of cases; post mortem there is hæmosiderosis of the liver and spleen, and aplasia of the marrow alternating with areas of megaloblastic hyperplasia.[4] If recovery occurs without treatment, or if treatment is insufficiently prolonged after confinement, the patient recovers to a certain extent, and then remains with a moderate anæmia, often of low colour-index. In the megalocytic phase the anæmia can be successfully treated not only with liver, but with marmite, a yeast extract rich in vitamin B. With either remedy there is a reticulocyte crisis and rapid improvement in the blood. Liver is rich in vitamin B, and it is probable that the curative effect of liver and marmite in tropical macrocytic anæmia should be ascribed to the vitamin B. Vitamin B is of no value in true Addison's anæmia,[13] and close as is the resemblance between tropical macrocytic anæmia and Addison's anæmia, they are undoubtedly due to different defects. The needs of the erythron are complex. For the maturation of normoblasts into erythrocytes, we already know that iron, thyroxin, and vitamin C are essential; for the maturation of megaloblasts into normoblasts, vitamin B and the nitrogenous complex of liver which is effective in Addison's anæmia.

It is important to remember that similar exacerbations of the anæmia occur in males and in non-pregnant women. There is no sign of hæmolysis, and the disease is quite different from the rare hæmolytic anæmia of pregnancy of the temperate zones. On the other hand, the very large number of cases of "pernicious anæmia of pregnancy" which have been described in the southern States of the U.S.A. seem to belong to this same nutritional, anhæmopoietic group. They are characterised by similar symptoms, glossitis, gastro-intestinal disturbances, incomplete repair of the anæmia after pregnancy, and a strong tendency to recurrence in subsequent pregnancies, and the diet seems to be very faulty.[2 48 60 61] Here also most probably belong some of the cases diagnosed as sprue without diarrhœa, in which severe anæmia develops during pregnancy.[28 36] Tropical nutritional anæmia has been extensively studied in China by Keefer and co-workers, who have found that it can be most effectively treated by a combination of liver and iron. It is indeed obvious from descriptions of the diets that there must be deficiency of several of the principles necessary for blood formation.

Pernicious Anæmia.

Pernicious anæmia has been so much discussed in recent years that the main facts can be briefly summarised. Addison's classical account was supplemented by precise descriptions of the blood and the blood-forming organs by Ehrlich and his pupils, while other continental workers demonstrated the increase in bilirubin in the blood and the excretions. Price-Jones showed that the megaloblastic degeneration of the bone-marrow was associated with an increase in the mean diameter of the erythrocytes and the presence of megalocytes in the circulation Hurst and co-workers demonstrated the essentia unity of Addison's anæmia and subacute combine degeneration of the spinal cord, and proved tha achlorhydria was the rule in both conditions. Typica Addison's anæmia was cured by restoration of th gastric secretion, either spontaneously or afte removal of septic foci and lavage,[12 30] while in significant number of cases Addison's anæmi developed after operations on the stomach.[31] Th Boston school of hæmatology, in one of the mos beautiful researches in the history of medicin showed that liver, stomach, and kidneys contain principle curative in pernicious anæmia, and tha this principle is normally elaborated in digestion b the stomach and stored in the liver and kidneys.[11]

The gastrogenous theory of pernicious anæmia founded on a firm basis of fact. The essence of th theory is that the stomach contains a rennin-lik ferment, which is not hydrochloric acid, nor pepsi nor rennin, and that this "intrinsic factor" acts o the proteins of the food to produce a hæmatin principle, which is necessary for the maturation megaloblasts into normoblasts and the norm delivery of red cells into the circulation. The hæm tinic principle is more active parenterally than b mouth, and it is almost certain that it acts directl on the erythron, and not on the alimentary tract the organisms contained therein. Its action is t stimulate the production of red cells and not to chec hypothetical hæmolysis. The discovery of th intrinsic factor of the stomach has solved many the problems of pernicious anæmia. The secretio of acid, pepsin, and intrinsic factor need not ru parallel. The intrinsic factor may be present i cases of anacidity, and it may be absent with a fr secretion of hydrochloric acid. It is thus explaine is associated with malabsorption of fat, and should be compared with the anæmia of chylous diarrhœa, sprue, and gastro-colic fistula. Achlorhydria is usually present. Again, the problem is whether achlorhydria precedes intestinal ulceration, the sequence being achlorhydria→intestinal ulceration→resection→anæmia, or whether, as seems more probable from the analogy of other fatty diarrhœas, achlorhydria and anæmia are the result of the intestinal resection and fatty diarrhœa. The anæmia may be simple or pernicious in type.

Becker (1030) describes the case of a 29-year-old woman who was operated on for tuberculous stenosis in several parts of the lower small intestine. At the time of the operation she did not show any remarkable paleness. Over 2 metres of the small intestine and the first part of the cæcum were removed, and she was freed from the stenosis troubles. Two months after the operation she began to notice œdemata and to feel tired. When five months after the operation she was taken to the hospital, she had a typical pernicious anæmia. The œdemata were quite large. On treatment with liver, there was a reticulocyte crisis and rapid improvement. The œdemata diminished but did not disappear. The patient was then taken ill with a double-sided otitis and erysipelas. She died in septicæmia. Post mortem it was established that a stenosis no longer existed.

Saltzman has reported a similar case in a woman of 28, who first came under treatment four years after the resection of 222 cm. of jejunum. She now had pernicious anæmia with achylia, which followed the usual remittent course and which responded to liver.

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INTESTINAL STENOSIS.

The association of pernicious anæmia with intestinal stenosis has been known for many years, and Meulengracht was able to collect accounts of 20 cases in 1929.[43] The strictures are usually tuberculous, and involve the lower part of the small intestine, occasionally the upper part of the colon. The tongue, the nervous symptoms, the blood, and the bone-marrow are all typical of pernicious anæmia. In Meulengracht's cases complete achylia was demonstrated in every case on which a test-meal was done; in one of his cases the test-meal was normal six years before the anæmia developed, but achlorhydria was present when the anæmia was detected. Becker (1930), Little, and A. F. Hurst (personal communication) have since described cases in which there was a normal secretion of hydrochloric acid. Thus achlorhydria is not an integral part of the disease, and it may be the result of the intestinal stricture. The anæmia responds to liver treatment with a reticulocyte crisis and prompt regeneration of the blood.[7 37 43 63] Seyderhelm's patient recovered without other treatment when the stricture was resected. Little's patient relapsed on omitting liver after the normal anatomy of the intestine had been restored, but diarrhœa was still present, and the normal function of the intestine had obviously not been regained.

The coexistence of such rare conditions as pernicious anæmia and intestinal stenosis points to an ætiological connexion, which was proved when Seyderhelm produced pernicious anæmia in two out of ten dogs by ligating the small intestine. He showed that the onset of anæmia was more closely related to the growth of an abnormal intestinal flora than to the degree of narrowing of the gut. He suggested that pernicious anæmia was due to the absorption of bacterial poisons from the intestine, that their growth was favoured by achylia, and that their absorption was due to abnormal permeability of the intestinal wall. There is no evidence that toxins are absorbed or circulate in pernicious anæmia, or that toxins can produce pernicious anæmia. It is simpler to assume that if the intestinal bacteria play a part, it is either the destruction of the hæmatinic principles of the food by their metabolic activities, or the impairment of digestion and assimilation by their local effects on the mucosa of the stomach and intestine. In conclusion, I should like to point out that the anæmia of intestinal stenosis is not always, and perhaps not most frequently, of the megalocytic type, for a hypochromic anæmia may develop in simple stenosis of the intestine, where there is no hæmorrhage or gross infection and toxæmia.

Miss A had operations for tuberculous glands in the neck and the mesentery at the age of 14. In adolescence she suffered from bilious attacks for which her gall-bladder and appendix were removed without benefit. At the age of 20 she was found to have chronic duodenal stasis, ileal stasis, and calcified abdominal lymph glands; the test-meal was normal, and the hæmoglobin 85 per cent. At the age of 22 she had definite obstruction of the terminal loop of the ileum, which was dilated, half full of gas, and lifted out of the pelvis; there was no occult bleeding; the blood count was: red cells, 3,880,000 per c.mm.; white cells, 8000; Hb., 64 per cent.; colour-index, 0·83. She was treated by Dr. Hurst with a low-residue diet, belladonna, liquid paraffin, and grs. 75 of iron and ammonium citrate a day, and two years later her symptoms were much better, the obstruction had diminished, and the hæmoglobin was 87 per cent.

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INTESTINAL PARASITES.

Much of the literature of the association of pernicious anæmia with intestinal parasites is uncritical, and the subject is worthy of careful review by one interested in hæmatology and parasitology. Many intestinal parasites have been reported in association with pernicious anæmia, but the only one which occurs with any frequency is *Dibothriocephalus latus*. Even so, pernicious anæmia from *D. latus* infestation is rare, and it has been calculated that in Finland, where many are infested with this worm, only from 0·1 to 0·5 per cent. of those infested develop anæmia. It also appears that the victims of *D. latus* anæmia are often predisposed to pernicious anæmia by heredity or by achlorhydria. Achlorhydria occurs in over 80 per cent. of cases, but it is sometimes the result of the disease, and free acid may return when the worm is expelled.[45 69] *D. latus* anæmia is of great interest, inasmuch as it may be repaired either by expulsion of the worm or by treatment with liver. Expulsion brings about a complete cure, while liver merely repairs the anæmia, which will relapse if liver is discontinued, and the parasite allowed to remain.[7] Many attempts have been made to explain *D. latus* anæmia by the liberation of hæmolysins from the parasite, but opinion is now changing to the view that it depends on the destruction of the hæmatinic principles of the food by the parasite, or diminished intestinal absorption.

GASTRO-INTESTINAL ULCERATION.

Many instances have been reported of pernicious anæmia in association with cancer of the stomach,[59] dysentery, and tuberculous ulceration of the bowel.[32] Complex factors are at work in these cases, such as achylia, intestinal dyspepsia, hæmorrhage, toxæmia, and defective diet, but the anæmia may respond well, and with the typical reticulocyte crisis, to treatment with liver.

Fatty Diarrhœa.

Donald Hunter has described the disturbances in the metabolism of calcium and phosphorus which

There is reliable evidence that the anæmia is due to shortage of iron, caused partly by improper food and partly by defective absorption from the alimentary canal. Iron is best absorbed from an acid medium, which explains the significance of achlorhydria. In those who have normal gastric secretion there are usually symptoms of intestinal dyspepsia. Anæmia is not uncommon in chronic abdominal invalids as a result of their restricted diet and poor digestion. Lyon estimated the hæmoglobin in 100 women with uncomplicated retroversion of the uterus, confirmed by operation, and found a third with only 70 per cent. or less hæmoglobin. This microcytic anæmia is practically confined to the reproductive epoch, and it is much aggravated by pregnancy. It persists with varying intensity throughout the child-bearing period, and then tends to improve spontaneously after the menopause. Seven women whom I have treated by the induction of an artificial menopause have all done well and remained free from relapse. Seppänen has clearly shown that women are more liable to anæmia than men, and the sex-incidence of simple achlorhydric anæmia can be explained by the greater frequency of achlorhydria and chronic abdominal invalidism in women, and by the strain of their reproductive life.

We have been specially interested in the gastric secretion in these cases of achlorhydria and anæmia. Until lately it seemed inexplicable why achlorhydria should sometimes be associated with perfect health, at other times with a microcytic anæmia, and at others with a megalocytic anæmia. Whether microcytic anæmia develops or not seems purely a matter of the iron metabolism. The normal diet provides only a small positive balance of iron, especially for women who are menstruating and bearing children, and this soon becomes a deficit if the diet is poor and absorption is diminished by achlorhydria. For the explanation of the megalocytic anæmia we are indebted to Castle's brilliant hypothesis. S. J. Hartfall and I have found that the subcutaneous injection of histamine into patients with simple achlorhydric anæmia or with pernicious anæmia induces a small secretion of gastric juice, and that in simple achlorhydric anæmia this juice may be as deficient in acid and pepsin as in pernicious anæmia. To ordinary tests they are identical. Nevertheless, on incubating beef with juice from simple achlorhydric anæmia, we obtained the curative principle for pernicious anæmia. We found that beef incubated with the gastric juice of a patient with pernicious anæmia produces no effect. Beef incubated with the gastric juice of a patient with simple achlorhydric anæmia usually causes a small reticulocyte crisis. Beef incubated with normal gastric juice is approximately as effective as an equivalent amount of liver. Thus the gastric juice in simple achlorhydric anæmia, and in patients who are normal except for achlorhydria,[11] contains Castle's intrinsic factor and protects the individual from pernicious anæmia.

In pernicious anæmia the damage to the gastric mucosa is higher in degree or different in kind from simple achlorhydric anæmia. The secretions usually fail in the order HCl, pepsin, intrinsic factor, but in rare cases the intrinsic factor may disappear and pernicious anæmia develop though acid and pepsin are conserved. A case may begin as simple achlorhydric anæmia and later pass into pernicious anæmia, because the secretion of HCl and intrinsic factor is successively exhausted. Partial recovery may occur and the pernicious anæmia give place to simple achlorhydric anæmia with the return of the intrinsic factor, HCl remaining suppressed. Members of families where a vulnerable gastric mucosa is inherited may differ in their response to the wear and tear of life, some developing pernicious anæmia from the complete failure of the gastric mucosa, others simple achlorhydric anæmia or a symptomless achlorhydria from its partial failure. Finally, we can understand how the digestion of the food may be perfect and yet anæmia develops owing to defective absorption from the intestine, and so a megalocytic anæmia may develop in spite of the presence of intrinsic factor in the stomach, or—much more commonly—the microcytic anæmia of iron deficiency develops in spite of a normal secretion of hydrochloric acid. Here we must leave Castle's hypothesis for further testing—and in my opinion for a certain modification—in the future.

Diseases of the Intestines.

In the study of anæmia in intestinal disease we are faced with more intricate problems than in the nutritional and gastrogenous anæmias. In addition to the intestinal disease there may be an imperfect diet and an impaired gastric digestion. The frequency of achlorhydria and glossitis in intestinal disease is remarkable. It is often assumed that this achlorhydria is primary, but while achlorhydria may favour infection of the intestine, we have unimpeachable evidence that achlorhydria may be the result of disease of the intestines, developing during the evolution of the illness, and often giving place to normal secretion on its cure, as I shall show when we consider intestinal stenosis, tapeworm infestation, sprue, and chylous diarrhœa. The mechanism of this action on the stomach is obscure. Morbid changes in the intestine may spread directly to the stomach, or irritant or infective material may ascend by reverse peristalsis. Lycopodium spores or other finely divided and easily recognisable material given in enemata can travel in a few hours from the rectum to the stomach, and lycopodium powder swallowed in sealed capsules may later be recovered from the mouth.[3] There is no difficulty about the mechanism of this process but it presumes an unknown irritant. There is less difficulty in supposing that nutritional disorders of a pellagroid type develop when absorption from the intestine is diminished by disease, with consequent glossitis and achlorhydria.

Another problem in the intestinal anæmias is the relative importance of disease of the stomach and of the intestine in their production. Is the usual sequence of events intestinal disease→gastric disease→anæmia, or do both stomach and intestine play a part in the anæmia? Estimation of the acidity of the contents of the stomach does not help us, and we shall not solve the problem until a simpler technique has been devised for the detection of the intrinsic factor of Castle in the stomach. We shall do well not to underestimate the intestinal factor, for Barnett's important case, which I have already quoted, shows that a megalocytic anæmia may develop in spite of the secretion of the intrinsic factor by the stomach.

RESECTION OF THE SMALL INTESTINE.

Resection of the small intestine, usually done on account of tuberculosis, provides the simplest examples of anæmia from intestinal disease. The literature [58] contains records of more than 90 patients who have survived the loss of over 2 metres of small bowel. There is little information about their state of health, though it is clear that they often suffer from diarrhœa and debility. The following three cases suggest that anæmia is a common sequel. It is associated with malabsorption of fat, and should be compared with the anæmia of chylous diarrhœa, sprue, and gastro-colic fistula. Achlorhydria is usually present. Again, the problem is whether achlorhydria precedes intestinal ulceration, the sequence being achlorhydria→intestinal ulceration→resection→anæmia, or whether, as seems more probable from the analogy of other fatty diarrhœas, achlorhydria and anæmia are the result of the intestinal resection and fatty diarrhœa. The anæmia may be simple or pernicious in type.

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A man, aged about 40, was readmitted to Guy's Hospital six months after an operation for strangulated hernia. He now had a stricture of the ileum and a moderate hypochromic anæmia. He succumbed to the operation for the relief of the stricture, and I found normoblastic hyperplasia of the bone-marrow in the centre of the humerus.

INTESTINAL PARASITES.

Much of the literature of the association of pernicious anæmia with intestinal parasites is uncritical, and the subject is worthy of careful review by one interested in hæmatology and parasitology. Many intestinal parasites have been reported in association with pernicious anæmia, but the only one which occurs with any frequency is *Dibothriocephalus latus*. Even so, pernicious anæmia from *D. latus* infestation is rare, and it has been calculated that in Finland, where many are infested with this worm, only from 0·1 to 0·5 per cent. of those infested develop anæmia. It also appears that the victims of *D. latus* anæmia are often predisposed to pernicious anæmia by heredity or by achlorhydria. Achlorhydria occurs in over 80 per cent. of cases, but it is sometimes the result of the disease, and free acid may return when the worm is expelled.[45,69] *D. latus* anæmia is of great interest, inasmuch as it may be repaired either by expulsion of the worm or by treatment with liver. Expulsion brings about a complete cure, while liver merely repairs the anæmia, which will relapse if liver is discontinued, and the parasite allowed to remain.[7] Many attempts have been made to explain *D. latus* anæmia by the liberation of hæmolysins from the parasite, but opinion is now changing to the view that it depends on the destruction of the hæmatinic principles of the food by the parasite, or diminished intestinal absorption.

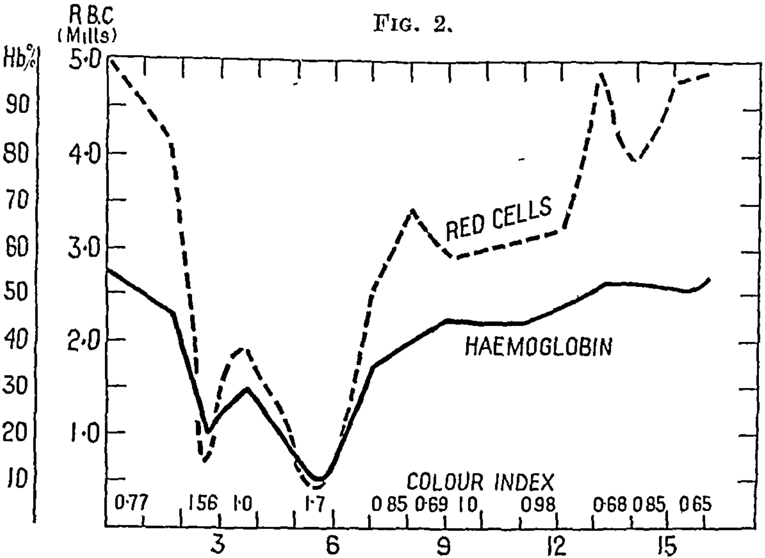
GASTRO-INTESTINAL ULCERATION.

Many instances have been reported of pernicious anæmia in association with cancer of the stomach,[59] dysentery, and tuberculous ulceration of the bowel.[32] Complex factors are at work in these cases, such as achylia, intestinal dyspepsia, hæmorrhage, toxæmia, and defective diet, but the anæmia may respond well, and with the typical reticulocyte crisis, to treatment with liver.

Fatty Diarrhœa.

Donald Hunter has described the disturbances in the metabolism of calcium and phosphorus which occur in fatty diarrhœa, and the consequent changes in the skeleton. The effects of fatty diarrhœa on the erythron are equally striking. If fatty diarrhœa persists for more than a few months, anæmia almost always develops. It tends to pass through the following stages: (1) hypochromic anæmia with normoblastic marrow; (2) megalocytic anæmia with megaloblastic marrow; (3) aplastic anæmia. At any of these stages recovery or death may occur, according to the progress of the primary malady. Characteristic changes in the white cells are lacking, and there is no shift to the right as in Addison's anæmia. Aplastic traits appear early, and though van den Bergh's reaction may be positive in the megalocytic stage, it is not so constant nor so intense as in Addison's anæmia. Liver produces a reticulocyte crisis and repair of the anæmia in the megalocytic phase, but is apparently without action in the hypochromic and aplastic phases.

FIG. 2.



Course of anæmia of cœliac disease.

It is natural to attribute the anæmia of fatty diarrhœa to the disturbance of intestinal digestion. On the other hand, glossitis and achlorhydria are frequent in all forms of fatty diarrhœa, and in sprue Castle has shown that the intrinsic factor may be absent even though hydrochloric acid is secreted freely by the stomach. Defective gastric digestion may therefore play a part in the anæmia of fatty diarrhœa. There is little doubt that the achlorhydria is often the result of the fatty diarrhœa, for several cases have been reported in which gastric secretion was normal at the onset, depressed at the height of the illness, and restored on recovery.

TABLE I.—*Blood Changes in 39 Cases of Cœliac Disease (Fanconi).*

Hæmoglobin per cent.	No. of cases.	Red cells in millions.	No. of cases	Colour-index.	No. of cases.	White cells in thousands	No. of cases.
70–60	8	6–5	9	1·5	1	20–15	1
60–50	11	5–4	11	1·5 –1·25	2	15–10	9
50–40	7	4–3	15	1·25–1 0	2	10–7·5	11
40–30	7	3–2	2	1·0 –0·9	1	7·5–5·0	8
30–20	3	2–1	2	0 9 –0·7	15	5<	8
20–10	1	1–	1	0·7 –0·5	9	—	—
10<	2	—	—	0·5 –0·3	5	—	—

CŒLIAC DISEASE.

The blood changes in cœliac disease are evident from Table I., which summarises Fanconi's observations. In his 39 cases the hæmoglobin was below 60 per cent. in 31, and below 30 per cent. in 6. The various phases of hypochromic, megalocytic, and aplastic anæmia were clearly evident, and Fanconi observes that these are not separate entities but merely different degrees of anæmia, through which the same child may pass in the course of the illness (Fig. 2). In three of the 39 cases the blood picture was identical with that of Addison's anæmia—*profound anæmia of the megalocytic type*, leucopenia and thrombopenia, hyperbilirubinæmia, and excessive output of bilirubin derivatives in the fæces. They differed from Addison's anæmia in that the secretion of free hydrochloric acid by the stomach might be normal and complete cure might be obtained. In fatal cases aplasia of the marrow was found, but there was at times considerable hæmosiderosis.

SPRUE.

Sprue is disease of tropical and subtropical countries more often occurring in th newcomer an the better class of people. It is characterised b sore mouth and tongue, anæmia, fatty diarrhœa loss of weight, and a tendency to remissions an exacerbations. Its ætiology is unknown. It is distinguished from pernicious anæmia not only by th characteristic diarrhœa, but by the low calcium content of the serum, the dilated colon, and the frequen presence of free HCl in the gastric juice. Subacut combined degeneration of the cord is a rarity in spru and I know of no case in which it has occurred alon with a normal gastric secretion. Nevertheless, ther are many cases which seem to share the features sprue and pernicious anæmia, and which "in th tropics would be called sprue, while out of the tropic they would be called pernicious anæmia; the diagnosis is largely a matter of geography."[73] Such case have been described by MacLester.

In a consecutive series of 26 cases Fairley an co-workers found hyperchlorhydria in 4, norm secretion in 7, hypochlorhydria in 8, and achlorhydria in 7; in the achlorhydric patients the chlorid secretion was such as to suggest that some acid wa secreted but was neutralised. Castle and co-worke found no "intrinsic factor" in sprue with megalocytic anæmia in spite of free secretion of hydrochloric acid. The number of such experiments small, and it would be premature to conclude tha the anæmia of sprue is always purely gastrogenous.

A woman described by Wood had typical spru diarrhœa, but in addition achylia and subacut combined degeneration of the cord.

A patient of mine was in the West Indies for four month in 1914, at which time she was 23 years old, then returne to England, and worked as a nurse. She suffered continually from glossitis and anæmia. In 1921 she went t China, and 18 months after her arrival developed typica sprue. She came home in 1928 and made a good recover on diet, liver treatment, and transfusions. In 1929 she wen to Jerusalem, and there nearly died from pernicious anæmia n I saw her in 1931 the anæmia had recovered on ment with desiccated stomach, but she had well-marked ate combined degeneration of the spastic type.

he anæmia of sprue is usually not so severe as icious anæmia, and Fairley points out that while 80 per cent. of cases of pernicious anæmia have than two million red cells at the first examina-, patients with sprue come with a red count ween two and four million, and less than 20 per are below this level. Exact knowledge of the atology of sprue dates from the pioneer observa-s of Hampson and Shackle, who published Price-es curves from a number of cases in 1924, which ed a megalocytic anæmia. It is now known the anæmia of sprue tends to pass through three es.

An initial stage of slight anæmia, the colour-index g low, and the changes in the bone-marrow quite ate.

An intermediary stage characterised by hyperplasia he bone-marrow with abundance of megaloblasts and alocytic anæmia.

A final stage of hypoplasia or aplasia of the bone-row with the blood picture of aplastic anæmia.

here are less polychromasia and punctate baso-lia than in pernicious anæmia, and nucleated red s are infrequent, but true megaloblasts may ur. Hyperbilirubinæmia is uncommon, and there no constant changes in the white cells. In the galocytic phase the anæmia responds to liver with eticulocyte crisis and an increase in the red cells l hæmoglobin, but liver has no effect in the hypo-omic and aplastic phases.

In Fairley's 67 cases the colour-index was above ity in 61 per cent. It was never really low, for no e was below 0·7. During the first few weeks of ess the colour-index was found under unity in out of seven cases, but shortly afterwards high ices were established and were maintained through-t the course of the disease. In 10 out of 11 cases, all but one of whom the colour-index exceeded ity, the Price-Jones curve was shifted to the right. e bilirubin content of the blood was rarely reased. The bone-marrow, examined at death in ght patients, showed megaloblastic degeneration three and aplasia in the other five. Fine granular gment was constantly found in the liver and other sues, but not all of it was iron, and hæmosiderosis as less striking than in pernicious anæmia.

Krjukoff's study of sprue in middle Asia gave sults in correspondence with those of Fairley in India. Krjukoff (1927) noted that megalocytosis gave place to hypochromia during the stage of recovery. He examined the bone-marrow at biopsy, and found hyperplasia and megaloblastic degeneration in every case. This was most marked when the anæmia was of moderate severity, and at times it rivalled anything found in pernicious anæmia. Megaloblasts were present in early cases also, but the dedifferentiation of the bone-marrow was not so advanced and the megaloblasts were still capable of maturing into normoblasts and microcytes.

TABLE II.—*Blood Count in 67 Cases of Sprue.*

Hæmo-globin per cent.	No. of cases.	Red cells in millions.	No. of cases.	Colour-index.	No. of cases.	White cells in thousands	No. of cases.
>100	1	6–5	6	1·6	2	>15	3
100–80	17	5–4	13	1·6–1·4	2	15–10	8
80–60	29	4–3	18	1·4–1·2	14	10–7·5	9
60–40	13	3–2	18	1·2–1·0	23	7·5–5·0	19
40–20	6	2–1	11	1·0–0·8	20	5·0–2·5	22
20<	1	1–	1	0·8–0·6	6	2·5<	—

In Baumgartner's series of 36 cases, mainly patients from China under treatment in U.S.A., 16 had a megalocytic anæmia, 12 a hypochromic anæmia, and 8 no anæmia. In those with a megalocytic anæmia the mean diameter of the red cells was 8·2 microns, the range being from 5·9 to 10·7 microns, figures strictly comparable with those of pernicious anæmia. In one of the cases with hypochromic anæmia and very low hæmoglobin the cells were smaller than normal (6·7 microns), while in another they were larger (8·0).

CHYLOUS DIARRHŒA.

In recent years much interest has been taken in a nutritional disturbance in adults in temperate climates, which resembles cœliac disease and sprue, and which is often called non-tropical sprue. The symptoms are fatty diarrhœa, an extreme degree of emaciation, severe anæmia, low blood calcium with its associated sensory and motor phenomena, and a lowered rate of metabolism, all these latter symptoms apparently being due to malabsorption of food and minerals. Changes in the spinal cord are unusual, but Munford's patient developed signs of subacute combined degeneration in spite of normal secretion of hydrochloric acid in the gastric juice. The stools are copious, greasy, and pale, containing an excess of fatty matters, chiefly as split fats; *Monilia psilosis* is not found. Rontgen examination reveals a distended colon and decrease in the density of the bones. In cases coming to operation or autopsy obstruction of the lacteals by tuberculous or other disease has been found,[52] and this obstruction to the absorption of fat may well be the root cause of the disease. In other cases, however, no post-mortem changes have been detected.

The hæmatology of chylous diarrhœa is identical with that of sprue, as may be seen from Table III., which is compiled from 26 cases taken from the literature, 4 under the care of Dr. A. F. Hurst, and 2 of my own. The anæmia may be hypochromic, megalocytic, or aplastic. Van den Bergh's reaction was negative in all of 7 cases in which it was performed, but Hegler found hæmatinæmia, as in Addison's anæmia. Test-meals were done on 25 patients, and the result was normal in 11, hypochlorhydria in 4, and achlorhydria in 10. The tongue was normal in 6, inflamed in 17. Umber, in a reference which I have been unable to study, describes the post-mortem findings in the bone-marrow as those of aplastic pernicious anæmia. The following cases are of special interest:—

One of my cases, a man of 62, was first diagnosed as Addison's anæmia on the basis of glossitis, achlorhydria, and a blood count of red cells, 2,500,000 per c.mm.; white cells, 3400; hæmoglobin, 55 per cent.; colour-index, 1·1, with megalocytosis. Further investigation showed that van den Bergh's reaction was negative, there were translucent areas in the bones, and there were up to six fatty motions a day. The test-meal was repeated after lavage, when the secretion of HCl proved to be normal. On treatment with HCl and liver extract the diarrhœa decreased to two motions a day, the hæmoglobin rose to 64 per cent., and 9½ lb. in weight was gained. He died two and a half years later after developing so much scoliosis that "his spine seemed to have shrunken."

Mrs. B, aged 48, who has a strong family history of tuberculosis, has been under my observation for 18 months with fatty diarrhœa, glossitis, hypochlorhydria, and cramps in the legs. Her blood count when first seen was: red cells. 3.100,000 per c.mm.; white cells. 5200; hæmoglobin, 54 per cent.; colour-index. 0·85; negative van den Bergh reaction. She had thorough treatment with liver, desiccated stomach, iron, and hydrochloric acid, but made no improvement till she was placed on a low-fat diet with calcium and vitamin D.

Hegler's patient in the spring of 1922 had a blood count of red cells, 4,630,000 per c.mm.; white cells, 6000 hæmoglobin, 58 per cent.; colour-index, 0·6; van den Bergh's reaction was negative, and there was hyperchlorhydria. In May, 1923, the blood count was red cells, 1,100,000 per c.mm.; white cells, 5000; hæmoglobin, 30 per cent.; colour-index, 1·4; the test-meal now showed anacidity, and there was hæmatinæmia. In the summer of 1928 she was much better, and the blood count was: red cells, 4,500,000 per c.mm.; white cells, 6500; hæmoglobin, 70 per cent.; colour-index, 0·8.

In Holst's patient there was glossitis with normal gastric acidity. The blood was very carefully examined by Gram: red cells, 1,320,000 per c.mm.; white cells, 4000; hæmoglobin, 39 per cent.; colour-index, 1·5; megaloblasts were present; the Price-Jones curve was typical of an Addisonian anæmia; the mean diameter of the red cells 8·5 m., the mean volume 136 cubic microns, the icterus index was 4.

TABLE III.—*Blood Changes in 32 Cases of Chylous Diarrhœa.*

Hæmoglobin per cent.	No. of cases.	Red cells in millions.	No. of cases.	Colour-index.	No. of cases.	White cells in thousands	No. of cases.
99–80	6	5–4	12	>1·4	3	>15	1
79–60	10	4–3	8	1·39–1·2	5	15–10	3
59–40	12	3–2	6	1·19–1·0	9	10–7·5	6
39–20	3	2–1	5	0·99–0·8	9	7·5–5·0	14
19<	1	1–	1	0·79–0·6	6	5·0<	8

PANCREATOGENOUS DIARRHŒA.

Walko comments on the frequency of anæmia in chronic pancreatitis, and describes a case of pancreatitis with typical pernicious anæmia. Holler and Kudelka found mild anæmia and increased diameter of the red cells very constantly not only in chronic pancreatitis but also in jaundice and in cirrhosis of the liver without jaundice. It is probable that a number of different factors are at work in these cases, such as achlorhydria, fatty diarrhœa, changes in the portal blood pressure, and in the chemical composition of the plasma, so that no special significance can be attached to them. For example, Thaysen reports four cases of pancreatic disease, two of whom had mild anæmia with high colour-index, but all four had achlorhydria or hypochlorhydria.

GASTRO-COLIC FISTULA.

Gastro-colic and jejuno-colic fistulæ are usually the result of gastric carcinoma or of gastro-jejunal ulcer. The most constant symptom is fatty diarrhœa, the other food elements being much better digested than might be expected. Fairley and Kilner have reported three cases with glossitis and megalocytic anæmia, which bore a close resemblance to sprue. Two of them, both with normal gastric acidity, were treated with a high protein diet and liver with great improvement in the anæmia. Poynton and Macgregor have reported a case of gastro-colic fistula with anasarca and hypochromic anæmia; there was no active ulceration or bleeding. One cannot but be impressed by the frequency of glossitis and anæmia in fatty diarrhœa of such different origins, and by the similarity of the effects produced on the erythron and the skeleton. The natural conclusion is that they are the effects of diminished gastro-intestinal absorption of the hæmatinic principles and of the inorganic elements of the bones.

Pellagra.

The pathology of pellagra is still obscure. The primary lesions are confined to epithelial surfaces without extension to deeper tissues or organs. The cutaneous manifestations are well known, but it is important to note that "lesions of the mouth, tongue, and œsophagus are the most constant and consistent lesions of pellagra."[15] I have always been impressed by this likeness to the Plummer-Vinson syndrome, and by the fact that pellagra affects females twice as often as males. The stomach and small intestine show no consistent anatomical changes, but a colitis of variable intensity is present in every case. Peripheral neuritis and psychoses may develop, but there are no tract degenerations of the spinal cord like the subacute combined degeneration of Addison's anæmia. Achlorhydria is present in 85 per cent. of cases, hypochlorhydria in 9 per cent., and normal gastric secretion in 6 per cent. diarrhœa is present in 60 per cent.[65]

Anæmia is not a striking feature in pellagra, which leads to death from other causes before the erythro is much affected, but there is nearly always some diminution in the cells of the blood and the protein of the plasma. These are secondary effects of th disease, which represent impaired digestion a absorption of protein, and are dependent upon th injury to the alimentary tract. In 41 cases Krjukof (1931) found the hæmoglobin below 70 per cent in 20, and below 50 per cent. in only 4. The anæmi was hypochromic in 28, orthochromic in 8, an hyperchromic in 5. The serum was very pale even i patients with megalocytic anæmia. The marro reaction was sometimes normoblastic, sometime megaloblastic, sometimes aplastic, but usually mixed reaction was present, and there was no clos agreement between the blood picture and the marro reaction. It would appear that the nutritiona defect in pellagra is too extensive to allow such pu reactions as are found in simple and perniciou achlorhydric anæmia, and too intense to allow th sequence of reactions of normoblastosis, megalo blastosis, and aplasia, which take place in fatt diarrhœa. The usual findings in pellagra are a hypo chromic anæmia and a normoblastic marrow wit traces of megaloblastosis and aplasia.

Disease of the Thyroid.

The thyroid is the only endocrine gland diseas of which is attended by anæmia. The thyroid wa originally in communication with the alimentar canal, and the anæmia of hypothyroidism is ver similar to the anæmias of nutritional and alimentar disease. As we might expect from animal exper ments, which show that thyroxin stimulates bloo formation,[54] hyperthyroidism per se does not gi rise to anæmia.[35] But women who develop hyper thyroidism are often of the chronic abdominal invali type, and many of them have achlorhydria. Thi probably explains the severe anæmias which ar occasionally met with in women with hyperthy roidism.[21 23 51] Meulengracht observed perniciou anæmia 8 times in 151 women with hyperthyroidism, it developed relatively early in life, from 7 to 28 year after the onset of hyperthyroidism, and was o moderate severity.

In experimental animals thyroidectomy causes hypochromic anæmia with moderate hyperplasia o the bone-marrow.[17 54] I have found little informa tion about the bone-marrow in myxœdema, but ther is apparently a mixture of hyperplasia and aplasia i varying degrees. Anæmia is present in some hal of the cases but is rarely profound. The hæmoglobi is reduced to about the same extent as the red cell or a little more, so that the colour-index is usuall a little below unity. There are no marked chang in the size and shape of the red cells. Achlorhydri occurs in a rather high proportion of hypothyroi patients—4 out of 16 of Stone's cases and 3 out of 1 of mine. It is often permanent, and persists afte nt of the thyroid deficiency, but Boenheim the gastric acidity normal after thyroid treat- n two patients, who had had anacidity in the meal before. The clinical resemblance to ous anæmia may be great. Two of Stone's s had been treated for pernicious anæmia success; their metabolism was low, and næmia improved on thyroid treatment. In lema there is no increase in the amount of n in the blood, and the size of the red cells is reased.

ight be expected from their age-incidence and sociation with achlorhydria, pernicious anæmia yxœdema may coexist in the same patient. ive cases reported by Means, in three of whom nicious anæmia preceded the myxœdema, in e myxœdema developed first, and in the fifth was no evidence which came first. Each disease ded to its own treatment, and their association ed to be fortuitous. We need more informa- bout the anæmia of thyroid deficiency, more lly as regards the behaviour of the bone- w, the permanence of the achlorhydria, and the ity of the response to thyroid treatment. In perience thyroid is of no value in any other a. In the Plummer-Vinson sydrome, for which been specially advised, I have never been able et any effect. On the other hand, the anæmia othyroidism does not respond to iron, arsenic, sfusions, and probably not to liver.

Conclusion.

n well aware that I have set myself and those ead this lecture an arduous task in surveying ormous literature, and a wealth of clinical and mental material. Much has of necessity been d. I have avoided discussion of subacute ned degeneration and allied nervous diseases, h they are susceptible of the same explanations disturbances of the erythron.[68] Apart from othing has been deliberately overlooked. The ce I have presented shows that anæmia due turbance of erythropoiesis occurs in a variety itional and digestive disorders. It is possible plain each and all of these anæmias by the tion of the organism in the materials necessary ood formation. Some of these materials have ly been isolated—iron, copper, thyroxin, vita- B, vitamin C—and others, such as the active ple of liver, cannot long elude analysis. The ation may be the result of imperfect diet, or of red digestion or assimilation. The anæmia is o diminished blood formation, and it may be cytic, megalocytic, or aplastic in type, accord- o the stage at which erythropoiesis is arrested. accept this explanation, we must revise many r ideas about digestion, both in the stomach in the intestine, but in so doing we may gain light on digestive disorders. We must also e that such infection of the mouth and gastro- tinal tract as may be present in these diseases ually secondary to the metabolic or digestive t, and plays little or no part in the initiation e anæmia, but it must be confessed that the rial and hæmolytic theories of these diseases ill repaid the laborious investigations they have ed. The field has been surveyed only, and problems await solution. Time may play with our theories, but the conception of a p of nutritional and gastro-intestinal diseases, y related in signs, symptoms, and hæmatology, ely to have a permanent place in pathology, ine, and therapeutics.

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THE TREATMENT OF DIABETIC URÆMIA WITH HYPERTONIC GLUCOSE SOLUTIONS.

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THE case reported below was admitted to the Aberdeen Royal Infirmary in diabetic coma, and passed into uræmia and anuria, eventually making a complete recovery. The extreme rarity of recovery under these conditions appears to warrant the publication of an individual case.

Case Record.

Miss A., aged 27, was admitted to hospital on Oct. 26th, 1931, unconscious, with marked air hunger, exhaling acetone strongly, and with her urine loaded with sugar and acetone. The case was diagnosed as diabetic coma.

Previous history.—About May, 1929, the patient began to get easily tired, to be a little thirsty, and to notice that she was slightly thinner. Her family doctor found sugar in her urine, and accordingly sent her for investigation to the Royal Infirmary. Her fasting blood-sugar was 218 mg. per 100 c.cm. She was placed on a diet to which she strictly adhered, and in consequence enjoyed good health. At subsequent examinations the fasting blood-sugar was always in the neighbourhood of normal. In January, 1931, she developed an ischio-rectal abscess on the right side, which burst. Apart from local discomfort this infection produced no general manifestations.

Present illness.—About a week before admission the patient developed another ischio-rectal abscess on the same side. This was treated with hot fomentations. The day before admission the patient began to feel off colour and seedy, and next morning gradually passed into coma. On admission she was definitely, but not deeply, unconscious, since resistance to passive movement was present. Respiration was deep and sighing. There was a strong smell of acetone in her breath. The skin was cold and clammy. The tension of the eyeballs was greatly reduced. The pupils were moderately dilated, and reacted sluggishly to light. The blood pressure was 122/70, the pulse-rate 96, and the temperature 97·2° F.

General examination.—Nutrition good. Respiratory, alimentary, and cardiovascular systems satisfactory. Nervous system normal. Plantar reflexes were flexor. A large ischio-rectal abscess was found in the right side, and was immediately opened. Black material, which was a mixture of pus and fæces, was evacuated. Small blue areas on the pads of several toes, suggestive of early gangrene, were present.

Laboratory data on admission (11.25 a.m., Oct. 26th).—Urine, catheter specimen, amount 8 oz., clear amber colour, acid reaction, specific gravity 1032. Sugar +++, 6·2 per cent. Acetone and diacetic acid +++. Albumin ++. Chlorides diminished. Microscopic examination of deposit: *many granular casts, scanty* hyaline casts, and epithelial cells. No erythrocytes or pus cells. Blood-sugar, 451 mg.; urea, 33 mg.; and chlorides, 613 mg. per 100 c.cm.

TREATMENT.

The patient was covered with warm blankets and surrounded with hot-water bottles. At 12 noon 50 units of insulin were injected subcutaneously. Within half an hour she partially regained consciousness, and 30 g. of glucose were given orally.

At 1 P.M. 40 units of insulin were given, and at 2 P.M. and 3 P.M. 30 g. of glucose. At 4 P.M. the blood-sugar was 486 mg. per cent., and the urine still contained considerable quantities of sugar and ketone bodies. Accordingly, 60 units of insulin were given, together with 30 g. of glucose. At 4.30 P.M. the patient sufficiently recovered consciousness to be able to answer questions. At 5 o'clock *30 g. of glucose were again given*, with continued improvement in every way. The patient, at this stage, was taking plenty of fluid by mouth. At 8 P.M. another 40 units of insulin were given. At 10 P.M. the patient was sleeping comfortably, respiration still sighing, acetone in breath and diacetic acid in urine present, but much less marked.

At 12 P.M. a catheter was passed, and only one ounce of urine was found in the bladder. Sugar and acetone were present, but much less in amount, while only a trace of diacetic acid was found. Blood was withdrawn, and the result of the estimation done next morning showed that the blood-sugar was 382 mg. per cent. The blood-urea had risen to 55 mg. per cent. and the chlorides remained approximately stationary at 627 mg. per cent. She was given 30 g. of gluco

Date.	Blood.			Urine.								Insulin (units).	Remarks.
	Sugar.	Urea.	Chlorides.	Amount (oz.).	Sugar.	Ketones.	Albumin.	Casts.	Blood.	Urea.	Chlorides.		
	mg. per cent.									mg. per cent.			
26/10/31: 11 A.M.	454	33	613	..	+	+	+	G.H.	–	780	130	190	Typical diabetic coma.
12 midnight	382	55	627	39¾	Tr.	Tr.	..	..	..	..	..	..	Patient conscious.
27/10/31: 10 A.M.	323	..	598	3½	Tr.	Tr.	+	G.H.	+	700	30	130	3½ pints N. saline with 5 per cent. gluc intravenously. Vomiting started. Si of ketosis gone. Anuria.
12 noon	177	110	..	..	..	..	..	..	..	..	..	..	
28/10/31	129	170	613	2½	Tr.	Tr.	+	G.H.	+	560	28	70	1 pint N. saline with 5 per cent. gluco Clinical condition about the same.
29/10/31	117	206	..	1½	Tr.	Tr.	+	G.H.	+	..	..	100	2 pints N. saline with 5 per cent. gluco Patient more alert.
30/10/31	454	220	..	2	0	0	+	G.H.	+	..	..	70	2 pints N. saline with 25 per cent. gluco Urinary flow restarted.
31/10/31	450	230	..	20	+	0	Tr.	Sc.	0	760	220	70	1 pint N. saline with 25 per cent. gluco
2/11/31	469	221	510	52	+	0	0	Sc.	0	710	300	40	Patient quite comfortable.
3/11/31	412	173	438	55	+	0	0	Sc.	0	..	320	40	—
4/11/31	328	133	..	31	+	0	0	Sc.	0	..	..	40	Complaint of pain in right side.
5/11/31	472	105	..	30	+	0	Tr.	Sc.	0	..	..	40	—
6/11/31	408	70	438	22	+	0	Tr.	Sc.	0	..	..	40	—
9/11/31	308	25	..	..	Free	0	0	0	0	..	..	40	—
25/11/31	130	25	..	..	,,	0	0	0	0	..	..	40	—

Tr. = trace. G.H. = granular hyaline. Sc. = scanty.

id 20 units of insulin. During the first 12 hours e patient received 190 units of insulin and 150 g. sugar. At 5 A.M. the bladder again contained ly an ounce of urine. in which a trace of sugar and etone was found. and no diacetic acid was present. ir-hunger was absent, so further insulin treatment as temporarily discontinued. At is time vomiting was first noticed. ark bilious material was brought p, the act having no relation to od.

For the following four days the atient was practically anuric. nce approximately two ounces of rine was all that could be obtained ach 24 hours by repeated catheterisation.

During this period she lay in an tremely lethargic condition, but was ble to understand simple questions. he temperature swung in an irregular anner between normal and 101° F. he blood pressure varied from 102 o 122 on different occasions. and the ulse-rate from 100 to 146. Although lenty of fluid was given by the mouth, he severe and continuous vomiting as uickly removed it, so that fluid was robably not absorbed by this route. ccordingly, approximately two pints f normal saline, containing 5 per cent. lucose, were given intravenously uring each 24 hours, and about 30 nits of insulin were injected subcutaneusly three times a day. Numerous lood-sugar estimations during this period showed that the vel varied from 120 to 300 mg. per cent., while the bloodrea steadily rose until on the fifth day after admission it eached 224 mg. per cent. The plasma chlorides were still ractically stationary, at approximately 600 mg. per cent. he small amount of urine obtained boiled almost solid ith albumin. and microscopic examination revealed large umbers of granular casts and red cells, signifying an acute oxic nephritis.

A résumé of the laboratory and clinical data is given in the accompanying table and chart.

THE USE OF HYPERTONIC INTRAVENOUS GLUCOSE.

A consideration of these facts led us to the conclusion that the condition of the patient had altered from diabetic coma to what might be described as diabetic uræmia. The position appeared to be critical. since in our experience patients with diabetic coma who develop a definite anuria, and in whom the blood-urea reaches 150 mg. per cent. or over, invariably die. The facts supporting this contention are appearing in a separate paper at an early date Simple remedies, such as hot fomentations and cupping the loins, had failed. Irritant diuretics appeared to be contra-indicated, as judged by the presence of blood and casts in the urine. As a last desperate resort it was decided to try to restart urinary secretion by raising the blood-sugar level to a high degree with hypertonic intravenous glucose. The matter is discussed in detail at the end of this paper.

Accordingly. at 5 P.M., and again at 10 P.M., on Oct. 30th. one pint of a 25 per cent. glucose solution in normal saline was given intravenously. The solution was introduced very slowly. about 40 minutes being taken for the injection. At 12.30 A.M. 8 oz. of urine were passed: this contained some sugar but no diacetic acid. During the rest of that day 20 oz. were passed. At 7.30 P.M. on Oct. 31st another pint of 25 per cent. glucose in normal saline was given intravenously. On the following two days, 3½ oz. and 52 oz. of urine were passed, and subsequently normal urinary secretion occurred. The blood-urea, which on the sixth day after admission had reached a maximum of 230 mg. per cent., steadily fell and returned to normal figures in nine days. The plasma chlorides, which up to this date had been somewhat above normal. fell to a figure slightly below normal.

No attempt was made to reduce the blood-sugar level to normal, since a definite danger from coma still existed, in view of the sepsis from the unhealed ischio-rectal abscess. The occurrence of a right-sided pleurisy with effusion. which started on Nov. 4th. was an additional reason for this policy. Adequate glucose and insulin were given daily to control all signs of ketosis.

On Nov. 9th aspiration of the right chest showed that a cloudy fluid was present in the pleural cavity. Microscopic examination revealed numerous polymorphs. but bacteriologically the fluid was sterile. During the subsequent four weeks the temperature gradually ceased to swing and returned to normal, where it has remained for the past month. The fluid has disappeared from the pleural cavity. some dulness at the base remains. and a few fine crepitations can be heard at the end of inspiration.

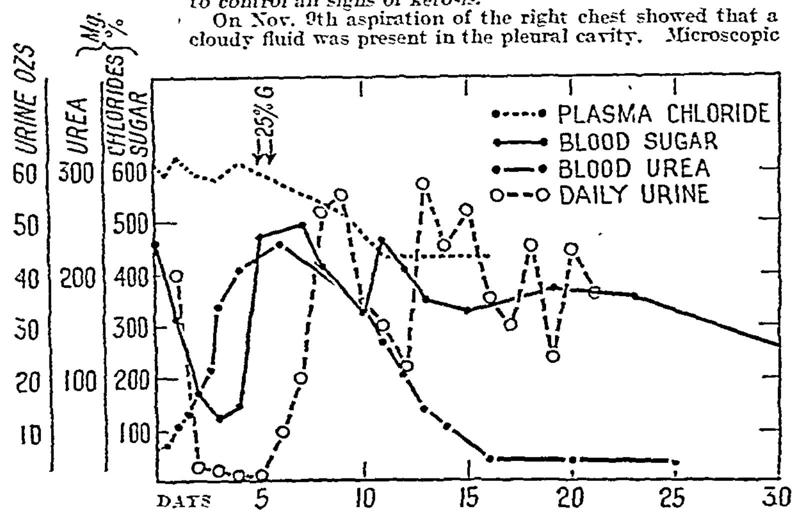

Chart showing effect of two injections of 25 per cent. glucose solution at points marked by arrows.

The urine is now normal in quantity, and the maximum concentration after the administration of 15 g. of urea is 2·3 per cent.; it is free of albumin, sugar, ketone bodies, casts. and cells. The ischiorectal abscess is healed. The diet has been gradually increased to 1800 calories. with 20 units of insulin twice daily. The patient's nutrition is excellent, and a complete recovery may now be said to have been achieved.

Discussion.

A number of observers have noted the occurrence of uræmia as a sequel of diabetic coma.

Joslin[1] emphasises a fact, already well recognised. that renal changes frequently occur in diabetic coma. though oliguria, and especially anuria, are uncommon. Ambard and Merklen[2] published a case in which the blood-urea increased to 180 mg. per cent., while the plasma carbon dioxide. after having been low, returned to normal and the patient died with nephritis. Merklen, Wolf, and Bicart[3] described a case somewhat analogous to our own, in a young woman in whom hyperglycosuria and acidosis were overcome by insulin treatment. but the patient developed an acute and fatal nephritis. with oliguria, albuminuria. and uræmia. John[4] observed a condition very like the present case in a young man in whom the blood-urea increased to over 200 mg. per cent., and remained at this level for five days. with retention of urine. Renal function was re-established by intravenous injection of 500 c.cm. of 1·4 per cent. saline and 1 per cent. sodium carbonate. and recovery took place. Unfortunately no information with regard to the volume of urine secreted or the blood chloride is available.

Recovery from diabetic coma, however, is rare when anuria supervenes, and in our experience the condition is nearly always fatal. Apart from anuria itself there may be evidence of nitrogen retention of almost any degree in the blood. If the increase in blood-urea be taken as an index of the failure of renal function, it would appear that the chances of recovery are low when this value is increased above 100 mg. per cent. In our own series of cases [5] we found that only one death occurred amongst 13 patients with diabetic coma where the blood-urea did not exceed 100 mg. per cent., but that four out of a total of six patients died where the blood-urea was above that figure. Combining the 31 cases collected from the literature by Labbé and Boulin [6] with our own figures, we find 56 cases of diabetic coma with elevation of the blood-urea. In 34 of these, where the value did not exceed 100 mg. per cent., there were six deaths, while 14 deaths occurred amongst 22 cases where the blood-urea value was over 100 mg. per cent. But the present case, along with that of John,[4] is evidence that recovery may still take place even when much higher blood-urea values are present, provided the urinary secretion can be re-established.

There is no doubt that renal function is to some extent disturbed in nearly all cases of diabetic coma, as evidenced by the presence of albumin, casts, and sometimes blood in the urine. Several factors are concerned in this type of renal failure, and a study of the literature would suggest that their importance varies in individual cases. These factors can, however, be classified as follows:—

(*a*) Circulatory disturbance in the kidney accompanying fall of blood pressure and cardiac failure.

(*b*) Dehydration of the blood-plasma due to lack of intake of fluid. previous polyuria, and often to vomiting (Bulger and Peters [7]).

(*c*) Increase [illegible] ogen metabolism (Lyall [8]).

(*d*) Actual [illegible] in the renal parenchyma, due to the e[illegible] of ketonic acids and salts and other metabolites in the early stages of the coma (Snapper [9]).

The increase in blood-urea is probably not wholly an index of the failure of renal function, since concentration of the chemical constituents of the plasma, including urea, is brought about by dehydration, as has been shown by Bulger and Peters.[7] Increased endogenous nitrogen metabolism also tends to cause an increase in the blood-urea, but in the later stages, when oliguria or anuria has supervened, the great increase in the blood-urea is almost certainly due to direct retention.

Blum, Grabar, and van Caulaert [10] have adduced evidence for the interesting suggestion that the azotæmia in diabetic coma is due not to a partial anuria, to renal changes or to the acidosis itself, but to the loss of salt from the blood and tissues. If this hypothesis were substantiated it would bring the azotæmia of this type into line with that which accompanies salt loss in conditions like upper intestinal obstruction, pyloric stenosis, and intense diarrhœa. These authors cited two cases of diabetic coma where the blood chlorine decreased to 284 mg. per cent., and the urea reached 480 mg. per cent. upon a chlorine-free régime. The blood-urea values rapidly returned to normal after administration of sodium chloride by mouth. But they failed to repeat these observations in other cases of diabetic coma, even in one of the same individuals in a later attack of coma. It should be remarked that both of the cases in which they originally observed the decrease in chlorides suffered from severe diarrhœa of 15 days' and 10 days' duration respectively—a condition in itself likely to cause hypochloræmia. In our own case the plasma chlorides remained high during the period of anuria, and did not commence to fall until the urinary flow restarted. In further observations of our own we have never found the plasma chloride low in diabetic coma, and in this we are supported by the careful researches of Bulger and Peters,[7] who in an investigation of the phenomena of dehydration in diabetic coma found the plasma chlorides to be either increased or normal. They usually observed that a marked increase occurred in the excretion of chloride during improvement, as also occurred in our own case. The kidney normally excretes chloride in abundance when the plasma chloride is above 520 mg. per cent. The fact that the urine of our patient contained only minimal traces of chloride, while the plasma chlorides were over 600 mg. per cent., is ample evidence of the inability of the kidney to excrete this substance.

Two problems are of particular interest in this case. (1) What is the cause of anuria in diabetic coma? (2) What factors influenced the renewal of urinary secretion? Information available at present makes it impossible to state categorically whether the anuria in diabetic coma is primarily the result of a nephritis caused by the excretion of irritating ketone bodies or whether the nephritis is secondary to dehydration, disturbances of osmotic equilibrium, and alteration in capillary circulation. The renal damage, and anuria which occurs in high intestinal obstruction in human beings and in experimental obstruction in dogs is undoubtedly in some way associated with salt loss. We can definitely say that this was not the cause of anuria in the present case, and we ar inclined towards the opinion that the anuria was th sequel of a parenchymal change in the kidney du to temporary toxic causes. The renewal of urinary secretion in this case followed the intravenous administration of hypertonic glucose.

A similar procedure has been found effective in children dehydrated by prolonged diarrhœa, as reported by Hoag and Marples,[11] who used 10 per cent glucose intravenously. Similarly, Comfort and Snell used 20 per cent. intravenous glucose to stimulat renal secretion in patients with anasarca secondar to cirrhosis of the liver. The mechanism causing th renewal of the urinary flow in the case reported b John does not appear to be the same as in the presen instance, since the solution given was only slightl hypertonic, and in our case several previous intra venous injections of normal saline with 5 per cen glucose had proved ineffective.

It is recognised that the kidney has a vital capacit for the secretion of certain substances when these a present in the blood stream above the threshold lev Sugar and chlorides were already present in co centration much above that level, and there was al a marked retention of urea. Raising the blood-sug level still higher by the intravenous injection hypertonic glucose does not appear to be a satisfacto explanation in itself for the subsequent diuresis. appears more probable that the renewed urina excretion was due to a disturbance of osmotic equi brium. Although clinically no evidence of œdem was recognised, experimental work on depancreatis dogs shows that tissue œdema may occur in t absence of gross clinical signs of its presence. Mig tion of fluid back into the capillary channels mig occur by a sudden disturbance of osmotic equilibriu such as would be caused by the introduction of fi times isotonic glucose solution. A gradual chang on the other hand, might not accomplish this, sin it would only result in equilibrium being re-establish at a new level. The result of a change in osmo pressure would be an increased blood volume, impro ment in the general circulation. better oxygenati of the blood, and increased blood flow through t kidney. These factors, in our opinion, may be t explanation of the renewed renal activity.

(*References at foot of opposite page.*)

PECIFICITY OF THE "PROTEOSE" INTRADERMAL REACTIONS.

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r. G. H. Oriel obtained a white precipitate from ie which he called "proteose"; he claimed that n this is isolated from an asthmatic patient's ie and injected into him intradermally "a reaction ults which is similar to that seen on the injection an antigen to which the allergic patient is sitised."[1]

his, if true, would be of the greatest importance: ady an immunotherapy has been based on it, l practitioners are sending cases of asthma, eczema, , to me, and without doubt to others also, with request "please treat with proteose." It does matter to pathology that the allergic diseases, amenable to suggestion, should be the happy ating ground of the experimental therapist; but abtful scientific theories should be tested, however congenial this work may be, or they may confuse ther research. At the end of November last I ve my reasons for believing this basic fact of the ecificity of the proteose to be wrong—or at least proven.[2] Since that date attempts have been made both sides at conversion, and I think that Oriel and s fellow-workers would no longer claim that the eged specific reaction was "similar to," let us say, e pollen reaction in a hay-fever patient. But he ill claims some specificity, as indeed he must if his eory is to stand on its feet and if his proteose therapy to be scientifically justified. I therefore made ore elaborate intradermal tests to confirm or remove y own doubts.

It will make things clearer if I explain at the eginning what I only learnt half-way through my ivestigations: proteose is not a chemical substance, ut a more or less fortuitous collection of substances roduced by the excretory activities of the kidneys. ith Oriel's latest technique, as well as with his arlier and less precise methods, you get "proteose" rom everyone's urine, but the iller the person the nore you tend to get of it. Proteose is always toxic, s might be expected; if injected into any man's kin, and if taken from any source—well or ill, llergic or non-allergic—you get in a few minutes a lightly raised wheal of varying size, and sometimes n erythematous flush round it, both wheal and flush fading in a few minutes more. The alleged specific reaction of proteose from an asthma patient on that patient's own skin is therefore not a question of positive and negative (as I first thought, and as it is with, say, grass pollen on the skin of hay-fever and non-hay-fever persons), but a question of slightly less or slightly more than one gets in the control cases —which are amongst themselves varying very considerably. Add to this the tendency to dermographia to which allergic cases are peculiarly prone, and it will be clear that for any critical opinion great caution must be taken in arranging the experiment.

THE HAY-FEVER "PROTEOSE."

In Fig. 1 the well-recognised reactions of pollen on the skins of hay-fever and of normal subjects (Columns I. and III.) are contrasted with the alleged hay-fever proteose reactions on neighbouring areas of skin on the same subjects (Columns II. and IV.). The pollen extract (poll.) was from my usual supply; the tests were made by placing drops of normal saline and of 10,000 unit pollen extract on neighbouring portions of skin, and then pricking through these drops with clean needles to the depth of perhaps a millimetre—i.e., till the person tested just experienced a faint prick; that is my usual technique for the diagnostic pollen reaction for hay-fever. The hay-fever proteose (H.F.P.). doubtless isolated from the urine of some hay-fever patient, was given me for testing by Oriel himself, together with his "control proteose" (C.P.)—i.e., a proteose isolated from a non-hay-fever subject. After a few tests I added normal saline as a second control. The tests of the proteose and its controls were made by intradermal injections of one-twentieth of a cubic centimetre of each of the fluids into neighbouring areas of skin—the method employed by Oriel and his fellow-workers. All these tests—the two pricks and the three intradermal injections—were made on three groups of persons: (1) the hay-fever subjects; (2) normal—i.e., non-allergic—subjects; and (3) allergic, but non-hay-fever subjects. All were taken as they came to hand and were not in any way selected, and all reactions have been traced off on glass and recorded without exception as they occurred.

It should be clearly understood that we cannot fairly compare the extent and the intensity of the reactions shown in Column I.—i.e., the pollen reactions—with the reactions in Columns II. and IV., because the prick through the drop of pollen extract into the skin can inject only a tiny fraction, say a fiftieth part, of the minim or so of fluid which was injected when testing the proteoses in Columns II. and IV. In spite of this the pollen reactions were as a rule more intense than the proteose reactions; the wheals were more raised, the flushes were more red, and both of them were longer lasting than the proteose reactions; after consideration no attempt has been made to indicate this in Fig. 1.

In all the reactions in Fig. 1 the central dot (where shown) indicates the point of entry of the needle; the unbroken ring shows the maximum extent of the wheal—usually in about 10 minutes; the broken ring shows the extent of the erythematous flush.[3] All the reactions were, as a rule, fading rapidly in 20 minutes, but, as has been said, the pollen reactions *tended to last somewhat longer*, besides being more intense.

I think we can say at a glance that Columns I. and III. in Fig. 1 show definite positive and negative

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[1] Proc. Roy. Soc. Med., Sec. Derm., 1931, xxiv., 55.

[2] The Lancet, 1931, ii., 1212, 1322; Brit. Med. Jour., 1931, ii.

[3] The hay-fever proteose of No. 4 in Column II., which is marked with a star, went too deep into the skin and so got lost.

(*Continued from previous page.*)

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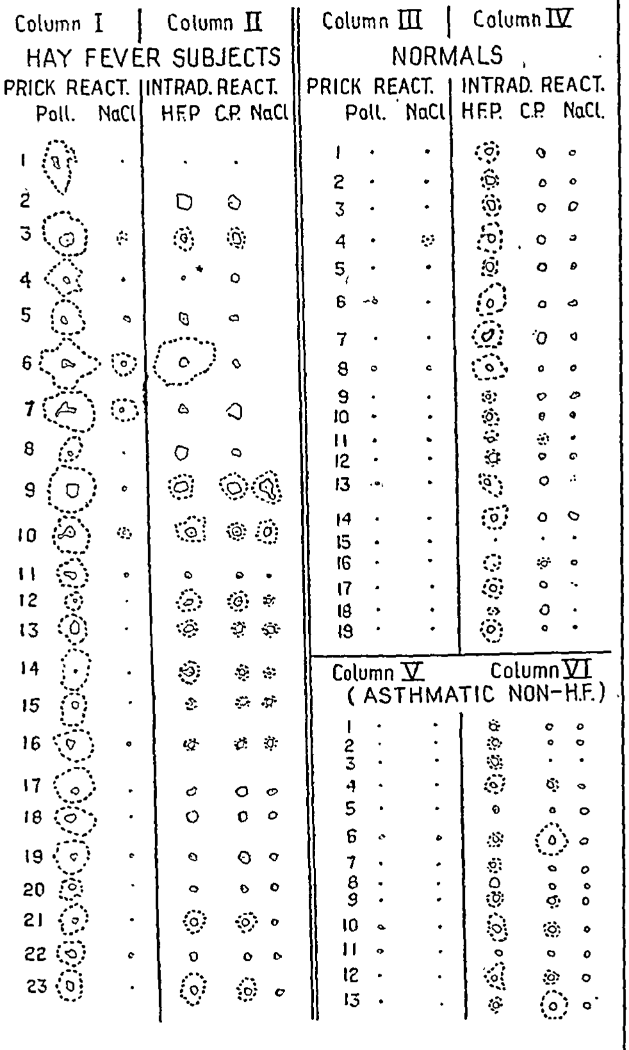
reactions respectively; for indeed the pollen reaction for hay-fever is about as reliable as the Wassermann reaction for syphilis. Columns II. and IV. should also show positive and negative reactions according to Oriel's story; they do not. One might perhaps have said that No. 6 in Column II. looks like a positive reaction, but it is discounted by the fact that the same subject shows in Column I. a "positive" reaction resulting from a prick through normal saline —i.e., this patient is dermographic. The proteose

FIG. 1.



reactions in Column IV. should all be negative according to Oriel's story (and according to mine, for that matter), but perversely enough many of them look like being positive [4] as shown in the figure, though their minor intensity. as compared with the true reactions from pollen in Column I., would probably render them dubious to anyone actually observing them.

THE ASTHMA-ECZEMA "PROTEOSE."

The intradermal reactions shown in Fig. 2 were all arranged after the controversial letters in *The Lancet* and *British Medical Journal*, and after I had seen at Guy's Hospital what very small differences were being taken to indicate a reaction, and the apparent lack of caution with which these possibly chance differences were being interpreted. In this intradermal technique (as in any other that I know of) it is possible to influence the result quite unconsciously to some slight extent, though I do not think that any clear-cut test like the pollen-hay-fever reaction could be obscured by this. The possibilities of error are these: (1) neighbouring areas of skin do not give quite the same reactions, the differences depending presumably on blood and nerve-supply [5]; (2) it is only normal human nature to see to it that the full one-twentieth of a cubic centimetre is injected of the fluid which according to theory ought to react, and to see to it that no excessive amount is injected of that which should not react; (3) apart from the mere amount of fluid we must consider the force and rapidity with which it is injected; (4) above all, the depth of injection into the skin makes a difference, for if given deep the reaction is lost or obscured, if very superficial the reaction is much more apparent.

It is possible, I think, to avoid all these sources of unconscious error if the injector does not know which fluid he is injecting or in what order he will be giving them. In Fig. 2 six different set of fluids had to be injected into the skin of each person tested; each fluid had its own particular syringe, and for each person the six syringes were shuffled till the injector did not know which was which till he looked afterwards at the inconspicuous identification marks. Thus a favourable or unfavourable site could not be chosen unconsciously.

Five proteoses were used, and to them was added normal saline solution to make the sixth fluid. O these five proteoses three were from pronouncedl allergic cases—two (O and J) were asthma-eczemas and one (P) was a bad case of asthma; the othe two proteoses were from normal persons—one (N from a rather nervous delicate young man, and th other (F) from a more robust but more elderl individual. These five proteoses were all extracte by my colleague, Dr. Roche Lynch, on publishe and unpublished instructions from Oriel, and aft a personal visit which Oriel kindly made to Roc Lynch's laboratory. The five proteoses were ma and used during the space of a few weeks only.

The control subjects were taken as they came hand and without discrimination between them. all three columns the reactions were traced off glass, and all recorded in the figure as they occurre The central dot again indicates the point of ent of the injecting needle; round this, however, the are here usually two unbroken rings. The inner o (marked with the thinner line) indicates the "pe d'orange" created by the injection itself, which w traced off on to glass immediately after the injectio The outer and thicker unbroken ring shows the great extent of the whealing, usually in seven to ten minut Where this second ring does not occur in the fig signifies that the wheal never grew larger than original "peau d'orange": this will be found y with the salt controls, for none of the proteoses ed to grow larger. The broken line, where it ars, signifies, as in Fig. 1, the outer limit of the rounding erythematous flush. As with the pro se reactions in Fig. 1, the whealing and flushing s usually slight as compared with authentic itive skin reactions.

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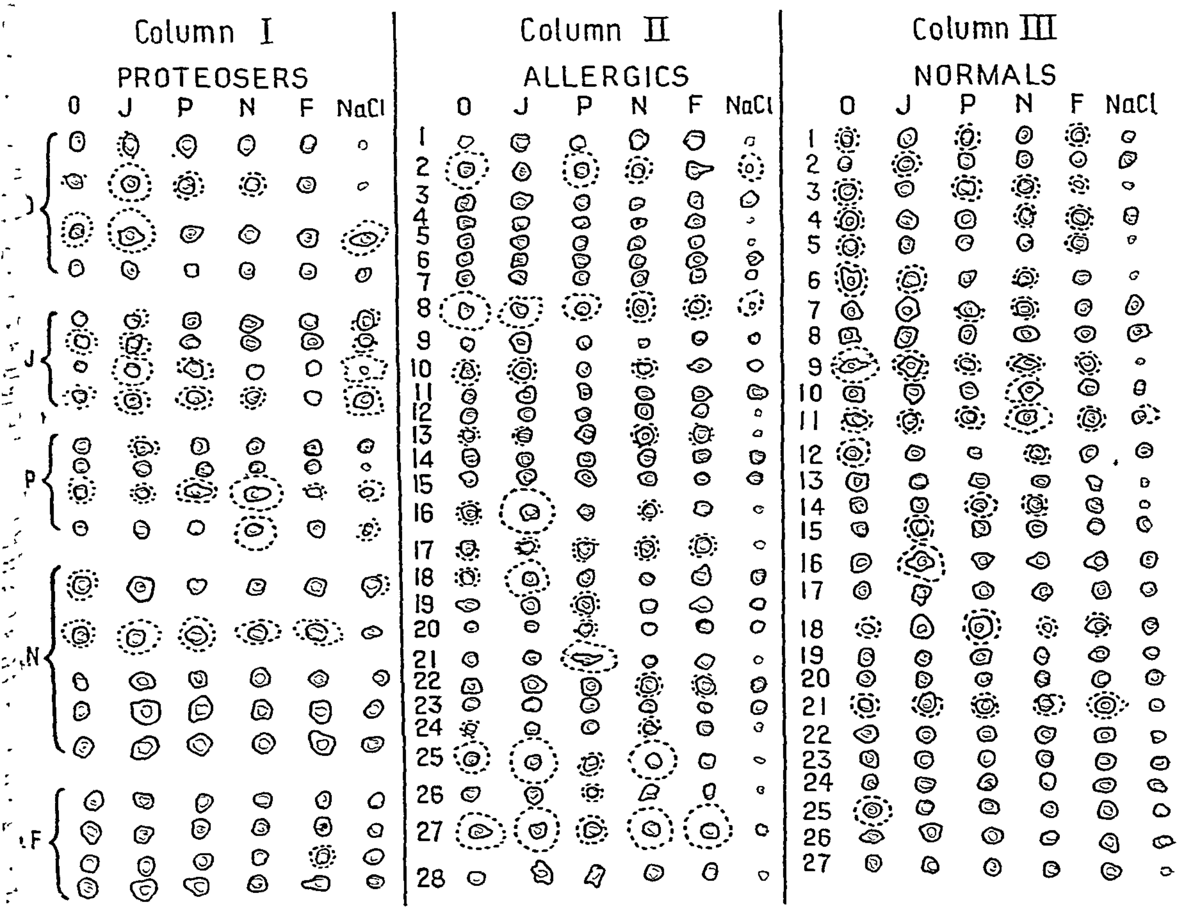
[4] This is probably due to the hay-fever proteose becoming more toxic with the passage of time; whereas Columns I. and II. were tested soon after receiving the proteose from Oriel, Columns III. and IV. were tested some four months later by which time the hay-fever proteose had become decidedly milky and, as this figure suggests, presumably more toxic though still sterile.

[5] In Fig. 1 an attempt was made to guard against this er by deliberately injecting the fluids in a different order in succes subjects. Thus for the first case the order of injections fr above downwards might be hay-fever proteose, normal sal and control proteose; for the next this might change to con proteose, hay-fever proteose, and normal saline; and so Thus each rival fluid would get the better station in turn.

[6] I do not think this helps us very much for even the nor saline in most of the subjects tends to spread during the ten minutes or so (see the "NaCl" reactions in all three colum but I recorded this because I found that my colleagues at Gu Hospital were doing so. It enables one to see to some ext how comparable were the mechanics of the various inject beside being able to say if there is any increase of wheal bey the first swelling of the skin caused by the injection itself.

olumn I. of Fig. 2 has been headed "Proteosers," l shows all the tests done on the five persons who yielded the five proteoses. They are indicated in the left margin by their already mentioned initial letters O, J, P, N, and F; and the proteoses obtained from these people are indicated at the head of each of the three columns by the same five initial letters, with the addition of "NaCl" signifying the normal saline control. It will be seen that the individuals O, J, P, and F were each of them tested four times over with each of the six fluids, while N was tested five times. The tests were made at different times of day and night, sometimes with three or four days in between; also, since the repetitions gave me opportunity of varying the areas, some were done on the usual sites of forearm or above the knee, while other tests were done on the calf of the leg, or across the chest, stomach, or shoulders. The more erythematous records—e.g., the second series on N—were obtained from stomach or chest. All this was done to eliminate the time and locality factors brought forward by Dr. Barber in his letter in THE LANCET of Dec. 5th, 1931, answering mine of the week before.[7] In Columns II. and III. the men were tested on the forearm, and the women and children on the anterior surface of the thigh.

FIG. 2.



If Oriel's story is correct then Miss "O" should react four times to O proteose, Master "J" should react to J proteose, and Mr. "P" to P proteose. All other skin tests in this figure, whether proteosers, allergics, or normals, should be negative save where an allergic person in Column II. happens to share the same allergic antigen with Messrs. "O," "J," or "P."

I think that anyone examining Fig. 2 carefully will find it impossible to detect any such specific reactions on the part of O, J, and P to their autogenous proteoses. I think there can be no failure to detect that so far as reactions can be said to occur they occur with everybody to all proteoses—in other words, that the proteoses are toxic.

Of the wellnigh 500 "reactions" shown in Fig. 2 there was only one which seemed to me to be quite of the pollen-hay-fever intensity, and this was allergic No. 21 to P proteose; possibly also normal No. 9's reactions to O and J proteoses might be placed in the same category. These three reactions have been distinguished in the figure by shading-in the erythematous area, but the three urticarial wheals (especially that of allergic No. 21) were also more intense than with the other so-called reactions in the figure. I cannot tell the significance of this.

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[7] I believe this time variant, when it occurs, to be largely due to the psychological factor in the man under observation, but it is perhaps worth controlling when trying to detect minute differences of reaction.

Many of the reaction sites of people in all three columns swelled up again in from 12 hours to three days after the injection, becoming red, swollen, and painful. All these delayed reactions disappeared again after about the length of time which it had taken them to show up. This did not occur more with the proteosers than with the allergics and normals, and there was no indication of specific delayed reactions of the proteosers to their autogenous proteoses. To avoid confusion, these reactions are not indicated in the figure; they were not the criterion selected by Oriel in his claim of specificity, and they were not all of them recorded in my notes. Presumably they are more akin to the Pirquet tubercle reactions or to the Schick test, &c.

In corroboration of my failure to find specific skin reactions with the autogenous proteoses, I am permitted to say that Dr. George Bray, working for the Asthma Research Council at Great Ormond-street Hospital, has obtained results which, he says, tally so exactly with mine that he does not think it worth while publishing them. I may also perhaps direct attention to the researches on the alleged specificity of proteose reported by Prof. Murray Lyon and co-workers.[8]

CONCLUSIONS.

1. Oriel's "proteoses," no matter whence obtained or on whom tested, show a fairly constant toxic reaction within a few minutes of injection into the skin. (They may also show a delayed reaction.) (2) I can detect no trace of the specific skin reactions claimed by Dr. Oriel. (3) An immunotherapy based on this alleged specificity has to my mind no scientific foundation. (4) Negative researches are dreary work; I hope I am now taking my leave of proteose.

THE DURATION OF THE RED LOCHIA.

By Chassar Moir, M.D., F.R.C.S. Edin.,

REGISTRAR TO THE OBSTETRIC UNIT, UNIVERSITY COLLEGE HOSPITAL.

It is usually believed that the blood-stained vaginal discharge which follows a normal confinement lasts for a period of about seven days, and that the persistence of this discharge for more than ten days is an indication of an abnormality such as retained pieces of placenta, subinvolution, or retroversion of the uterus. The following extract from a standard text-book[9] is representative of the usual teaching:—

> "In the average case with the mother suckling the child the lochia remain bright red for three or four days, then become pinkish-brown for three or four days; at the end of eight, nine, or ten days they lose their colour and are represented by an almost transparent fluid. . . . The lochia may remain coloured for rather longer than usual in cases in which the mother does not suckle her child."

It has long seemed to me that the cases which obey this rule are far outnumbered by the exceptions, in which the coloured lochia persist for some weeks without any discoverable abnormality. In order to obtain more exact information on these matters I have made special note of the duration of the lochia and the condition of the uterus in 250 patients whom I have personally examined at the postnatal clinic of University College Hospital.

The great majority of patients who attend this clinic have been delivered in the hospital five or six weeks previously, and each patient, before discharge from hospital, has been examined. and any abnormality, such as retroversion of the uterus, corrected. It follows that the proportion of normal cases in the postnatal clinic is very high. This is particularly so because many patients known to be debilitated while in hospital are sent to a convalescent home, and may not report to the postnatal clinic for some months. Such cases have not been included.

In this investigation no attempt was made to distinguish between lochia rubra and lochia serosa; each patient was carefully questioned on the duration of a red vaginal discharge, and the answer noted. The amount of the discharge was not taken into account because patients vary so much in their ability to describe quantities in accurate terms. A daily red or reddish-brown discharge sufficient to necessitate the wearing of a diaper was taken as the criterion of the duration of the red lochia for the purpose of this investigation. In a great many cases it was found that during the last three or four days in hospital the patient ceased to have a red discharge, but that with the resumption of household duties this discharge reappeared. In such cases the short interval was ignored, and only the final dis appearance of the coloured lochia was taken int account. Each examination included questionin the patient with regard to general health and breas feeding, after which a general physical examinatior with special reference to the pelvic organs, wa made.

TABLE I.

Total number of cases examined 250
Average duration of coloured lochia .. .. 24 da

Duration of red lochia.	Number and percentage.	Duration of red lochia.	Number a percentag
Under 10 days..	35 (14)	22–28 days ..	63 (25)
11–14 ,, ..	40 (16)	29–35 ,, ..	50 (20)
15–21 ,, ..	47 (19)	Over 35 ,, ..	15 (6)

Table I. shows that the duration of the colour lochia was variable, but that in the great majori of cases it was far in excess of the "normal" ten-d period. In 70 per cent. of patients it exceed 14 days, and in 51 per cent. it exceeded three wee

FACTORS INFLUENCING DURATION.

The question at once arises as to the part play by abnormal uterine conditions in bringing abo this persistence of blood-stained discharge.

Subinvolution.—The uterus five weeks after delive is not fully involuted, and may be best describ as being one and a half times the size of a norm parous uterus. With a little experience it is easy recognise the usual size and to pick out those ca in which the uterus is bulkier than usual. Such ca numbered 34. Subinvolution when combined wi retroversion was not included in this group.

TABLE II.

Subinvolution of the uterus (without retroversion)—
Number of cases 34
Average duration of coloured lochia .. 25·2 d

Duration of coloured lochia.	Number and percentage.	Duration of coloured lochia.	Number percentag
Under 10 days..	5 (14·7)	22–28 days ..	4 (11·7
11–14 ,, ..	6 (17·7)	29–35 ,, ..	6 (17·7
15–21 ,, ..	9 (26·4)	Over 35 ,, ..	4 (11·7

It will be seen that, although there was an unusua long duration of coloured lochia in a few cases, t *average duration for this group* was not apprecial rent from that of the normal group. In many s the duration was unusually short; hence it be assumed that subinvolution by itself is not a e of a prolongation of coloured lochia.

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[8] Brit. Med. Jour., Jan. 23rd, p. 136.

[9] Midwifery. By Ten Teachers. London, 1931 (4th ed.), p. 525.

etroversion of the Uterus.—These cases are few, use retroversion is corrected before the patient es hospital, and pessaries are used to maintain correct position in the first few months of the rperium. Not infrequently retroversion is found e associated with subinvolution. Such cases are uded under the heading of retroversion.

TABLE III.

oversion of the uterus (with or without associated ibinvolution)—

Number of cases	25
Average duration of coloured lochia ..	21·6 days

uration of ured lochia.	Number and percentage.	Duration of coloured lochia.	Number and percentage.
ler 10 days ..	8 (32)	22–28 days ..	6 (24)
11–14 ,, ..	1 (4)	29–35 ,, ..	4 (16)
15–21 ,, ..	5 (20)	Over 35 ,, ..	1 (4)

The cases of retroversion recorded in this table w an average duration of coloured lochia which lightly less than that of the total group (21·6 days l 24 days).

Effect of Suckling.—It is frequently stated that kling promotes the involution of the uterus, and versely that the uterus of a woman who does not kle her child involutes at a slow rate. The great jority of hospital patients nurse their babies, and only 29 cases were recorded where no suckling had ken place. These were mostly women whose children d been born dead or had died soon after birth. Table IV. shows that in the 29 recorded cases me degree of subinvolution was present in four ses. There was no undue prolongation of the loured lochia in this group; the average duration as actually slightly less than that of the total mber of cases (20·8 days, and 24 days).

TABLE IV.

Total number of women who did not suckle ..	29
Number found to have subinvolution of uterus ..	4
Average duration of coloured lochia	20·8 days

Duration of coloured lochia.	Number and percentage.	Duration of coloured lochia.	Number and percentage.
Under 10 days ..	7 (24)	22–28 days ..	9 (30·9)
11–14 ,, ..	3 (10·3)	29–35 ,, ..	4 (13·5)
15–21 ,, ..	6 (20·6)	Over 35 ,, ..	—

Parity and Age.—The cases were further divided into groups to show the effect of parity, and of age, in determining the duration of the lochia.

Primiparous patients	170
Average duration of coloured lochia	23·5 days
Multiparous patients	80
Average duration of coloured lochia	25·5 days

Age.	Number.	Average duration of coloured lochia.
25 years and under ..	117	24 days
26–35 years	103	24·5 ,,
35 and over	31	23·8 ,,

Thus, neither parity nor age has any appreciable effect in altering the duration of the coloured lochia.

CONCLUSIONS.

1. The duration of a coloured vaginal discharge following childbirth in 250 hospital patients varied considerably, but in the great majority of cases it far exceeded the supposed normal time limit. The average duration was 24 days. 2. The average duration of the coloured lochia in cases of uterine subinvolution and of retroversion was not greater than the average of the total number of cases. 3. In this series there were 29 cases in which suckling was not carried out. Those cases did not show any prolongation of the coloured lochia. 4. Age and parity had no appreciable effect on the duration of the coloured lochia.

CLINICAL AND LABORATORY NOTES

CASE OF APPARENT URINARY MYIASIS.

BY J. GORDON, M.D. LEEDS, D.P.H.,
LECTURER IN BACTERIOLOGY, UNIVERSITY OF LEEDS;
AND
G. ROSEMONT, M.B., B.SC. LEEDS.

CASES of urinary myiasis are rare, and in those hat have been reported the larva concerned is either hat of the lesser house-fly, *Fannia canicularis*, or f the latrine fly, *F. scalaris*. At any rate in the ext-books I have consulted there is no reference o the appearance of the larva of the common house-fly, *Musca domestica*, in the urinary tract. (Byam and Archibald: "The Practice of Medicine in the Tropics," 1921. Patton: "Insects, Mites, Ticks, and Venomous Animals of Medical and Veterinary Importance," 1929. Castellani and Chalmers: "Manual of Tropical Medicine," 1919.)

The patient was aged 50, male, and suffering from chronic parenchymatous nephritis. On passing urine into a chamber pot he felt a sudden sharp pain and observed that he had passed three larvæ. The following night (7 P.M.) he experienced the same pain on passing water and passed a single larva. On this occasion he reported it to his medical man. The larva was that of *M. domestica* in its final stage, and curiously transparent; the latter fact and the season of the year (December) in which the larva was passed suggested that it was not of accidental occurrence in the vessel. It is not known how larvæ gain access to the bladder in the male, but the suggestion has been made that it is by boring through into this position from the alimentary canal.

The larva was submitted to Prof. D. Keilin, F.R.S., who confirmed the diagnosis. We are indebted to Dr. Ll. Lloyd, reader in entomology, University of Leeds, for his assistance in the discussion of the case.

RECURRENT RUPTURED TUBAL GESTATION.

BY JOHN C. HODGSON, M.D. EDIN.,
HONORARY SURGEON TO ASHFORD HOSPITAL, KENT.

RECENT correspondence in these columns [1] prompts me to describe this case in the belief that the occurrence of ruptured tubal pregnancy twice within six months in the same woman may be worthy of record.

Mrs. A., a nervy woman, aged 32, with one child of 6 years, walked into the surgery on August 27th, 1931, complaining of severe pain in the right side, and scanty menstruation which was about a week been distinguished in the figure by shading-in the erythematous area, but the three urticarial wheals (especially that of allergic No. 21) were also more intense than with the other so-called reactions in the figure. I cannot tell the significance of this.

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[1] THE LANCET, Jan. 16th, p. 132; Jan. 23rd, p. 209; Jan. 30th, p. 261; Feb. 6th, p. 315; Feb. 13th, p. 371.

Many of the reaction sites of people in all three columns swelled up again in from 12 hours to three days after the injection, becoming red, swollen, and painful. All these delayed reactions disappeared again after about the length of time which it had taken them to show up. This did not occur more with the proteosers than with the allergics and normals, and there was no indication of specific delayed reactions of the proteosers to their autogenous proteoses. To avoid confusion, these reactions are not indicated in the figure; they were not the criterion selected by Oriel in his claim of specificity, and they were not all of them recorded in my notes. Presumably they are more akin to the Pirquet tubercle reactions or to the Schick test, &c.

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MEDICAL SOCIETIES

ROYAL SOCIETY OF MEDICINE.

ECTION OF THE HISTORY OF MEDICINE.

a meeting of this section held on March 2nd. h Dr. R. O. Moon, the President, in the chair, a er on the history of the

ntroduction of Biochemistry into Medicine

read by Dr. W. Langdon Brown. It was, he l, Paracelsus who was generally regarded as the ner of physiological chemistry; for it was he who rded Galenic tradition and taught chemical rapeutics. Additions to our knowledge of digestive cesses and the discovery of carbon dioxide were de by Van Helmont, who, however, had laid ater store by his speculative doctrines than by se practical achievements. He was the founder the iatrochemical school, which reached its zenith h Sylvius. Although ignorant of the fundamental ts of chemical science the iatrochemists had empted in vain to explain the functions of the ly entirely by reference to chemical operations. om them rose a school which attempted to explain the phenomena of the body upon mechanical nciples—the iatromathematical school, led by relli. Here was an example of the unwisdom premature attempts to state medicine in terms of mistry and physics. The danger was recurrent d there was to-day in certain quarters a tendency push biochemistry to unjustifiable conclusions, led a new school of iatrochemistry. In the ne way, although to settle down under the vitalistic potheses merely spelt obscurantism, the equation d the graph were so mentally satisfying, things came out" so neatly that there was a distinct mptation to apply mathematics too soon to clinical rk. The reaction from the iatrochemists had soon ne with Stahl who stood forth at the close of the venteenth century as the founder of animism. hich doctrine had maintained itself in many minds rough two succeeding centuries and existed still.

Dr. Langdon Brown then turned to the history of the roduction of certain biochemical methods and ideas to the diagnosis and treatment of disease. hough in 1777 Stevens had studied digestion foodstuffs in perforated silver balls by inducing stone swallower to swallow and regurgitate them, e first clear picture of gastric digestion had been ven by Beaumont's observations on Alexis St. Martin 1822. Two years later Prout had shown the esence of hydrochloric acid in the gastric juice. e gastric sound first employed by Leuke in 1883 d the test breakfast devised by Ewald had soon ought the recognition of the absence of hydrochloric acid in gastric carcinoma and its excess in ptic ulcer. But the introduction of the method of ctional test-meals had given an entirely new point f view, dynamic rather than static and therefore pically biochemical. Thus the importance of e bactericidal properties of hydrochloric acid had en learnt and the discovery made of achlorhydria in to 6 per cent. of apparently healthy individuals. An achlorhydric diathesis had been established as a ctor in what the speaker had called predestination in disease.

Pepsin was discovered by Brücke in 1851 and trypsin by Danilewski in the following year. Kühne had shown that the more profound disintegration of the protein molecule by the latter enzyme was responsible for the colour reaction with bromine water. Neumeister had given the name of tryptophan to this, merely implying that it was an indication of tryptic activity. There the matter had rested until 1901 when Hopkins and Cole had isolated tryptophan and had shown it to be an aromatic body and an important constituent of many proteins. This was the starting-point of the researches of the greatest practical value, for in 1906 by depriving rats of tryptophan in their diet Hopkins had shown that they failed to grow. From these experiments had come the recognition of the importance of the accessory food factors, resulting in the revolution of our conceptions and treatment of deficiency diseases. A by-product of the study of tryptic digestion had proved of far-reaching importance, for when these amino-acids had been identified they or their intermediate products were in certain circumstances found in the urine instead of their normal end-products. The occurrence of the abnormal excretion of such substances was usually congenital and familial. On this foundation Sir Archibald Garrod had built up his work on the inborn errors of metabolism. Such conditions as alkaptonuria, pentosuria, cystinuria, and porphyrinuria were admittedly rare and usually almost symptomless, but through them the conception of diatheses had been reinstated on a new and scientific basis on the lines of Mendelian inheritance.

It would be difficult, he said, to assess the value of biochemistry in our knowledge of nephritis, for while it had revealed the inadequacy of the classifications based on morbid anatomy it had not replaced these by any clear-cut conceptions. Richard Bright's description in 1827 of the disease associated with his name showed that he had appreciated the pre-renal factors in nephritis. Gradually those substances which the kidney failed to excrete had been found to be of greater importance than those which it allowed to escape. Methods for the quantitative estimation of urea in urine had been introduced by Ludwig, Doremus, and Dupré in 1853 and the following years. But for some time the results were misinterpreted because the amount of protein in the diet was not then known to influence the amount of urea in the urine. A clear idea of renal efficiency necessitated a comparison of the urea in the blood and the urine—a comparison first made by Widal and Javal in 1905. The recognition of urea retention in certain cases of nephritis and not in others had led to the distinction by the French school between hydræmic and azotæmic nephritis. But biochemistry to-day was chary of accepting the idea of a watery dilution of the blood volume. Rowntree and his co-workers in 1929 had shown that in glomerulo-nephritis and nephrosis the blood volume was within normal limits except that it might be slightly raised where there was accompanying anæmia. The induction of diuresis had no constant effect on blood volume; evidently the excess of fluid had to be drawn from the tissues.

The history of the biochemistry of lymph formation and œdema started in 1844 when Ludwig put forward a physical conception of urinary secretion, the blood pressure being the motive power for the filtration through the glomerular epithelium, while reabsorption occurred in the tubules. Heidenhain in 1866 had strongly opposed this view, regarding glomerular activity as a true secretion. When Ludwig discovered overdue. On examination a tender pulsatile mass was found in the right fornix. At operation a ruptured tubal pregnancy was found in the ampullary portion of the right tube with some bleeding into the peritoneal cavity. The right tube was removed and she made an uninterrupted recovery.

On Feb. 8th, 1932, she again walked into the surgery, complaining of slight pain on the left side, and an excessive period with clots, which had gone on for over a week. She last had an ordinary period at Christmas time. Vaginal examination was done with difficulty because of the nervous state of the woman, and appeared negative. The uterus did not seem palpably enlarged, and while the cervix seemed a little soft it was not patulous. She was slightly anæmic, and was given some ergot and told to go home to bed, but to send if the pain returned. She did not send for 72 hours, when I found her semi-moribund lying in bed with all the signs of advanced internal hæmorrhage. She was hurried to the operating theatre, where the peritoneal cavity was found full of blood-clot, the uterus about the size of a tangerine orange, and a tubal mole extruding from a tear in the ampullary portion of the left tube. The left tube was removed, and on account of her critical condition gum saline was given intravenously at the end of the operation. She again made an uneventful recovery.

The left tube was sent to Maidstone pathological department, where they were unable to observe any abnormality to account for her condition.

I may say that Cullen's "umbilical sign" was not present on either occasion.

PERSISTENT ALLANTOIC DIVERTICULUM CAUSING INTESTINAL OBSTRUCTION.

By J. E. A. Boucaud, M.B. Lond.,
RESIDENT SURGEON, COLONIAL HOSPITAL, PORT OF SPAIN;
AND
J. A. Waterman, M.B. Glasg.,
GOVERNMENT MEDICAL OFFICER, TRINIDAD.

A MAN, aged 53, was admitted to the Colonial Hospital, Port of Spain, on Oct. 4th, 1931, at 7 P.M., with the history of having drunk some coconut water the previous evening, and of vomiting and abdominal pain since.

On admission.—Abdomen was soft with slight tenderness in the epigastrium. He had a left inguinal hernia, but there was neither incarceration nor strangulation. Per rectum nil. Temp., 99° F.; pulse-rate, 88; respirations, 28. He vomited several times during the night. Enema produced a constipated stool and some flatus.

On Oct. 5th, at 6 A.M., temp., 98·4°; pulse-rate, 58; respirations, 20. On examination at 9 A.M. nothing abnormal was noted in heart or lungs. The abdomen was slightly distended in the epigastric region. Liver dullness not reduced. He complained of slight discomfort in the region of the umbilicus. But he continued to vomit yellowish fluid. At 2 P.M. the general condition was good. An enema resulted in a small motion.

On Oct. 6th, at 6 A.M., temp., 97·8°; pulse-rate, 58; respirations, 20. He had vomited three times during the night. Vomitus at 5 A.M. had a definite fæcal odour. The epigastrium was still distended. Per rectum collapsed gut was palpated. The stomach was washed out and the fluid returned was definitely fæcal. Operation was advised but refused. Turpentine and ox-gall enemata were tried with little success. But his general condition remained very good until the evening of Oct. 8th. At 8 P.M. his vomitus was fæcal in character. The pain in his abdomen became more severe. At 10 P.M., temp., 97·6°; pulse-rate, 92; respirations, 28.

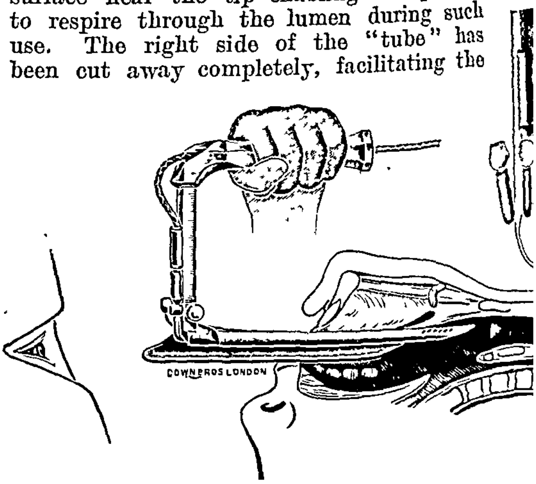
On Oct. 9th he consented to have the operation. Before the anæsthetic his stomach was washed out. A right paramedian incision was made. A portion of the small intestine, mesentery excluded, was caught in a circular opening in the wall of the bladder. This opening was due to an invaginated proximal end of a persistent allantoic duct. The intestine distal to this was quite collapsed, but as soon as the obstruction was relieved dilatation was effected. There was no gangrene. The site of pressure on the small intestine was not ulcerated, and the circulation was good. A Lembert suture was introduced to bury the line of constriction. The persistent allantoic diverticulum was evaginated and sutured to the peritoneum of the anterior abdominal wall, and the abdomen closed.

The patient made an uninterrupted recovery and was discharged well on Oct. 23rd.

NEW INVENTIONS

ILLUMINATED DIRECT LARYNGO-PHARYNGOSCOPE.

THE instrument here described I have been usin for a considerable time; it is longer than the usua pattern and it has definite advantages. It is adequat for the largest adult; but owing to the tapering o the end, is convenient for children of two years ol For examination of or operation on the larynx i gives very good exposure, and the tip can be passe between the vocal cords; it is useful also as an upp œsophageal speculum, and will reach all forei bodies in the common site of impaction, imm diately below the cricoid, the slotting of the ventr surface near the tip enabling the patient to respire through the lumen during such use. The right side of the "tube" has been cut away completely, facilitating the passage of instruments. An anæsthetic tube built into the left wall, abolishing the need fo separate anæsthetic tube, and delivering the vap well down the lumen. The "tube" of the instrum is of stainless steel, 20 cm. long, and 16 by 20 m internal diameter; the right wall is absent, a s of 1 cm. wide being left. Commencing at 8 cm. fr the tip the width is gradually tapered to 8 mm. at tip, which is blunt; at the same time the vent wall is discontinued, so that the distal 5 cm. definitely a concave spatula, the concavity gradu lessening toward the tip. Illumination is by me of a Jackson-type lamp carrier, taking the stand lamps (2·5 milliamperes) which are carried at distal end. The handle is also of the Jackson ty but hollow, so that the lamp-flex is carried well aw from the upper end during use.



Messrs. Down Brothers, Ltd., St. Thomas's-stre London, S.E., are the makers of the instrument.

E. WATSON-WILLIAMS, *M.C.*, F.R.C.S

breath or found they could breathe more easily the head was raised higher than usual. If such nor respiratory difficulties had not been recognised, barrassment would probably become evident der anæsthesia, and especially during the second age. Tracheotomy might then be unexpectedly cessary with risks which would not otherwise have en present. Lung complications accounted for the ajority of fatalities. Oral sepsis must be vigorously rrected before operation on the throat, and though is might not be the anæsthetist's province, he was t uncommonly held largely responsible for pulonary complications. After removal of teeth e gums must have soundly healed before the eration. Most of the subjects of serious throat perations were at or past middle age, and their ouths were seldom in really good condition. Packs aked in cocaine and adrenalin were employed to nder the mucous membrane analgesic, and they ere instrumental in lessening the amount of general næsthetic required. To make a tracheotomy pening in these cases was better than to carry ut endotracheal anæsthesia; there was always he possibility that the tube might carry infection, r at its insertion might dislodge a portion of growth nd so disseminate it in the lungs. A further reason was that a tube restricted the surgeon's field of ctivity.

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After tracheotomy the regular to and fro breathing was replaced by a different type—namely, one in which long periods of apnœa were followed by periods of dyspnœa—and this might persist throughout the operation, afterwards giving place to the normal breathing. Unless surgeon and anæsthetist were aware of this, they were apt to become alarmed and to perform artificial respiration in apnœic periods.

In the large group of cases in which the operation was away from the opening in the larynx and there was no danger of obstruction, one of the intratracheal methods was best. He preferred to apply the vapour under low pressure through a soft tube, which provided for a return airway and allowed of packing off the larynx. Passage of the tube by the nasal route had many advantages. For operations in the hypopharynx and on the cords and in which tracheotomy was necessary, he thought it might be better for the patient if the tracheotomy were always done under local anæsthesia and if time was allowed for him to accustom himself to that type of breathing, rather than for both procedures to be done under general anæsthesia at one time.

DISCUSSION.

Dr. **Ll. Powell** agreed with Dr. Morris's general plan, but preferred to use a bellows rather than a stream of oxygen to convey the chloroform.

Mr. **Lionel Colledge** agreed, as an operator in these cases, that the main principle was that there should be no respiratory obstruction. Tracheotomy was not necessary in every case. If respiratory obstruction was allowed to occur, it was usually too late to do tracheotomy, for the damage had already been done; the tracheotomy might restore the breathing, but after that the anæsthesia would not proceed quietly again, and if there was a pulmonary complication in that type of case it was not due to the anæsthetic as such but to the respiratory obstruction. He saw no object in using general anæsthesia for tracheotomy; it was much simpler and easier under a local anæsthetic, and from the beginning the anæsthetic could be administered through the tracheotomy tube. He had never seen trouble due to the use of chloroform. Delayed chloroform poisoning was relatively much more likely to develop in children and young adults. When the entire larynx had to be removed, if there was no obstruction—though often there was—it was useful at an early stage of the operation to open the cricothyroid membrane, put in a laryngotomy tube, pass the anæsthetising material through that, and remove the laryngotomy tube with the larynx. That obviated the necessity of doing a preliminary tracheotomy, and one had a clean wound, without risk of sepsis from a preliminary operation.

Dr. **A. L. Flemming** suggested it might be useful to add CO_2 to the mixture to overcome the apnœic phase after the performance of tracheotomy.

Mr. **John Hunter** endorsed all that Dr. Morris had said as to the use of chloroform in these throat cases. He found that the old men who usually required these operations took chloroform well, especially as the amount needed was materially reduced by the introduction of cocaine into the open larynx, and if morphia was used towards the completion of the operation this also lessened the required dose of chloroform. From the operative standpoint he did not see the need for the tracheotomy to be a separate preliminary procedure; it should be done at the same time as the main operation. But if obstruction existed, tracheotomy was required and the patient should be returned to bed to await the operation proper.

Sir **Francis Shipway** said he was glad to hear chloroform recommended. Where a tracheotomy tube was used in these cases it was impossible to give a fatal dose of chloroform. He had seen respiration arrested by a heavy dose, but though nothing was done it restarted. Nor did he think a continuous stream of oxygen constituted a danger. Prof. Buckmaster's work showed that during chloroform anæsthesia oxygen tension was reduced by 40 per cent., so there was no danger of over-oxygenating. Oxygen was needed because during chloroform administration there was a definite anoxæmia.

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SECTION OF ANÆSTHETICS.

At its meeting on March 4th, with Dr. G. **Ramse Phillips**, the President, in the chair, this sectio discussed

Anæsthesia for Major Throat Operations.

Dr. **C. W. Morris** said these operations presented many difficulties. Respiration might be hindere by obstruction of the airway by the growth, an there was a grave threat of pulmonary complications The surgeon must be allowed the maximum freedo for his manipulations—especially in lateral pharyngo tomy. Degrees of embarrassment short of actu stridor and cyanosis must be recognised and minimised A proportion of patients would not admit they ha experienced difficulty in breathing, indeed they migh not have been aware of it; only by close questionin could it be ascertained that at times they were shor breath or found they could breathe more easily the head was raised higher than usual. If such nor respiratory difficulties had not been recognised, ibarrassment would probably become evident der anæsthesia, and especially during the second ge. Tracheotomy might then be unexpectedly cessary with risks which would not otherwise have en present. Lung complications accounted for the ajority of fatalities. Oral sepsis must be vigorously rrected before operation on the throat, and though is might not be the anæsthetist's province, he was t uncommonly held largely responsible for pul-onary complications. After removal of teeth e gums must have soundly healed before the eration. Most of the subjects of serious throat erations were at or past middle age, and their ouths were seldom in really good condition. Packs aked in cocaine and adrenalin were employed to nder the mucous membrane analgesic, and they ere instrumental in lessening the amount of general næsthetic required. To make a tracheotomy pening in these cases was better than to carry ut endotracheal anæsthesia; there was always he possibility that the tube might carry infection, r at its insertion might dislodge a portion of growth nd so disseminate it in the lungs. A further reason as that a tube restricted the surgeon's field of ctivity.

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At its meeting on March 4th, with Dr. G. Ramse Phillips, the President, in the chair, this section discussed

Anæsthesia for Major Throat Operations.

Dr. C. W. Morris said these operations presented many difficulties. Respiration might be hindere by obstruction of the airway by the growth, an there was a grave threat of pulmonary complication The surgeon must be allowed the maximum freedom for his manipulations—especially in lateral pharyngo tomy. Degrees of embarrassment short of actu stridor and cyanosis must be recognised and minimised A proportion of patients would not admit they ha experienced difficulty in breathing, indeed they migh not have been aware of it; only by close questionin could it be ascertained that at times they were shor breath or found they could breathe more easily the head was raised higher than usual. If such nor respiratory difficulties had not been recognised. barrassment would probably become evident der anæsthesia. and especially during the second ge. Tracheotomy might then be unexpectedly cessary with risks which would not otherwise have en present. Lung complications accounted for the jority of fatalities. Oral sepsis must be vigorously rrected before operation on the throat, and though is might not be the anæsthetist's province. he was t uncommonly held largely responsible for pul-onary complications. After removal of teeth e gums must have soundly healed before the eration. Most of the subjects of serious throat erations were at or past middle age, and their ouths were seldom in really good condition. Packs aked in cocaine and adrenalin were employed to nder the mucous membrane analgesic, and they ere instrumental in lessening the amount of general æsthetic required. To make a tracheotomy pening in these cases was better than to carry ut endotracheal anæsthesia; there was always e possibility that the tube might carry infection. r at its insertion might dislodge a portion of growth nd so disseminate it in the lungs. A further reason as that a tube restricted the surgeon's field of ctivity.

For severe throat operations the anæsthetic of hoice was chloroform with oxygen. Dr. Morris aid he was aware of the existing prejudice against hloroform. and he was of course against its indis-riminate use in the wrong type of case. Mr. Wilfred rotter had told him that during the time he had een performing these operations he had never had nxiety on account of the chloroform anæsthesia. nd that was the speaker's experience over 20 years. here must be a free airway and plenty of oxygen. uring the operation the patient was noticeably ree from any tendency to congestion and hæmorrhage, nd it was usual for him to leave the table with he coughing reflex present and the pulse little aster than at the beginning of the operation. In one of his cases had there been delayed chloroform oisoning. With modern apparatus the supply of xygen could be kept separate from that of chloroform, nd mostly no more than 3 to 4 drachms of chloroform er hour was required.

After tracheotomy the regular to and fro breathing was replaced by a different type—namely. one n which long periods of apnœa were followed by periods of dyspnœa—and this might persist throughout the operation. afterwards giving place to the normal breathing. Unless surgeon and anæsthetist were aware of this. they were apt to become alarmed and to perform artificial respiration in apnœic periods.

In the large group of cases in which the operation was away from the opening in the larynx and there was no danger of obstruction. one of the intratracheal methods was best. He preferred to apply the vapour under low pressure through a soft tube. which provided for a return airway and allowed of packing off the larynx. Passage of the tube by the nasal route had many advantages. For operations in the hypopharynx and on the cords and in which tracheotomy was necessary. he thought it might be better for the patient if the tracheotomy were always done under local anæsthesia and if time was allowed for him to accustom himself to that type of breathing, rather than for both procedures to be done under general anæsthesia at one time.

DISCUSSION.

Dr. Ll. Powell agreed with Dr. Morris's general plan, but preferred to use a bellows rather than a stream of oxygen to convey the chloroform.

Mr. Lionel Colledge agreed. as an operator in these cases. that the main principle was that there should be no respiratory obstruction. Tracheotomy was not necessary in every case. If respiratory obstruction was allowed to occur. it was usually too late to do tracheotomy. for the damage had already been done; the tracheotomy might restore the breathing, but after that the anæsthesia would not proceed quietly again. and if there was a pulmonary complication in that type of case it was not due to the anæsthetic as such but to the respiratory obstruction. He saw no object in using general anæsthesia for tracheotomy; it was much simpler and easier under a local anæsthetic. and from the beginning the anæsthetic could be administered through the tracheotomy tube. He had never seen trouble due to the use of chloroform. Delayed chloroform poisoning was relatively much more likely to develop in children and young adults. When the entire larynx had to be removed. if there was no obstruction —though often there was—it was useful at an early stage of the operation to open the cricothyroid membrane. put in a laryngotomy tube. pass the anæsthetising material through that. and remove the laryngotomy tube with the larynx. That obviated the necessity of doing a preliminary tracheotomy. and one had a clean wound. without risk of sepsis from a preliminary operation.

Dr. A. L. Flemming suggested it might be useful to add CO_2 to the mixture to overcome the apnœic phase after the performance of tracheotomy.

Mr. John Hunter endorsed all that Dr. Morris had said as to the use of chloroform in these throat cases. He found that the old men who usually required these operations took chloroform well, especially as the amount needed was materially reduced by the introduction of cocaine into the open larynx. and if morphia was used towards the completion of the operation this also lessened the required dose of chloroform. From the operative standpoint he did not see the need for the tracheotomy to be a separate preliminary procedure; it should be done at the same time as the main operation. But if obstruction existed. tracheotomy was required and the patient should be returned to bed to await the operation proper.

Sir Francis Shipway said he was glad to hear chloroform recommended. Where a tracheotomy tube was used in these cases it was impossible to give a fatal dose of chloroform. He had seen respiration arrested by a heavy dose. but though nothing was done it restarted. Nor did he think a continuous stream of oxygen constituted a danger. Prof. Buckmaster's work showed that during chloroform anæsthesia oxygen tension was reduced by 40 per cent., so there was no danger of over-oxygenating. Oxygen was needed because during chloroform administration there was a definite anoxæmia.

Mr. T. Ritchie Rodger thought there was no sufficient reason for believing that injection of adrenalin was dangerous when chloroform was used.

Dr. J. Blomfield said that the point of importance in regard to the use of adrenalin in these cases was the difference in its action when injected and when it was applied on a swab. In Dr. Morris's paper the reference was to the use of adrenalin on swabs. These caused no trouble. and that was also the speaker's experience. The trouble which had occurred with adrenalin when chloroform was used was when it was injected.

Sir FRANCIS SHIPWAY referred to a case of chloroform anæsthesia for a mastoid operation in which adrenalin was poured into the wound to stop bleeding, and the patient died.

Dr. I. W. MAGILL said that Dr. Morris remarked that sometimes a general anæsthetic was needed for the tracheotomy but the speaker did not see why. He referred to a case of pulmonary and laryngeal tuberculosis, with much obstruction and cyanosis, in which the patient insisted on a general anæsthetic for the tracheotomy. He, Dr. Magill, decided to oxygenate the patient first, and introduced the oxygen under positive pressure through the small aperture in the larynx. That was very satisfactory to a patient who was suffering from laryngeal obstruction. His own practice was to connect up to the tracheotomy tube by a closed system, and he gave nitrous oxide and oxygen, with free medication, beforehand; chloroform could be added if necessary. In giving chloroform by the open method it was an advantage to have CO_2 also. He had been glad to hear the good word for cocaine, for its advantages were very certain. In a cocainised larynx administration of chloroform was one of the simplest and easiest forms of anæsthesia. Chloroform seemed to be the only anæsthetic a strong man with cancer of the larynx could take well, and he seemed to suffer no ill after-effects. Better results were obtained from nembutal if it were not used as a basal narcotic by itself; one should aim at a balanced anæsthesia, i.e., using some morphia and scopolamine an hour beforehand. Only a very small quantity of nembutal was then needed, and less was necessary to be eliminated from the system afterwards. Much of the restlessness of patients who had nembutal was due to their having had an overdose of it. There was no object in inducing deep sleep, it was preferable to have the patient at a stage in which he could answer questions. He had seen some successful total excisions of the larynx carried out under regional block anæsthesia; some patients did better under that than under a general anæsthetic.

Dr. HUGH PHILLIPS said that one of his practical difficulties was in the use of a lead delivery tube. This, on account of its weight, had a tendency to pull the tracheotomy tube on to one side. He had therefore had made a curved platinum tube, and attached this to a light indiarubber delivery tube. He had not found premedication necessary. The apnœic periods after carrying out tracheotomy could be quite alarming, and in these circumstances he turned on a little CO_2, with a few inhalations of ether, afterwards continuing with the chloroform. He agreed with what had been said as to the use of a local anæsthetic. He had never found any harm result from a swab of cocaine and adrenalin; it helped the anæsthesia, and the amount of chloroform required was thereby reduced.

SECTION OF THERAPEUTICS AND PHARMACOLOGY.

AT a meeting of this section on March 8th, with Dr. E. P. POULTON, the President, in the chair, a discussion on specific and non-specific

Desensitisation in Allergic Disease

was opened by Dr. G. H. ORIEL. Allergic disease and asthma, he said, were not necessarily synonymous; there was one type of asthma in which it was not possible to prove allergy. Allergy meant an altered reaction to a foreign protein, while asthma was only a symptom. Normally there was no antibody to protein in man; in sensitisation antibodies were present in the tissues but not in the blood-stream, while in immunity antibodies were present chiefly in the blood stream and to a less degree in the tissues. The ideal to be aimed at was to transform sensitisation into the normal state, but this was rarely accomplished. If a rabbit was sensitised to egg protein, egg precipitins appeared in the circulation; after a few months' rest these precipitins had disappeared but on the injection of a non-specific protein, such as T.A.B., the precipitins reappeared; in this case sensitisation had been transformed to immunity. Tuberculin, peptone, and T.A.B. had all been used in non-specific therapy.

In a case of asthma it was important to decide whether the condition was allergic or not. More than 300 proteins could be used for skin tests, which meant a tedious and exhausting process, especially as some asthmatics were positive for nearly all of them. All sensitised patients gave a positive test to human hair. Working in conjunction with Dr. Barber, he had found that a proteose was present in the urine of an allergic patient which gave a positive skin test in that patient. The proteose obtained from one asthma patient would give a positive result in another asthma patient who was sensitised to the same protein as the first. In the intervals between the attack there was little of the proteose to be found in the urine, often less than 1 per cent.; during an attack, however, it increased rapidly to about 10 per cent. and then fell again equally rapidly. This suggested that it was a break-down product; and it was important to determine whether this was so, for if the patient was sensitive to his own break-down products, treatment must be approached from that point of view.

In a passively sensitised guinea-pig an injection of proteose obtained from an allergic patient produced a typical uterine contraction. In the normal guinea-pig proteose produced only a small uterine contraction, and histamine a large one; in the sensitised guinea-pig the contractions produced by proteose and histamine were equal in size. These experiments indicated that the proteose substance was not identical with histamine. Four criteria must be fulfilled if a substance was to be accepted as the cause of asthma in a patient: (1) It should be capable of producing asthmatic attacks. (2) The Prausnitz-Küstner reaction should be positive. (3) It should be possible to use the substance to perform passive sensitisation. (4) Skin tests should be positive.

NON-SPECIFIC DESENSITISATION.

Prof. STORM VAN LEEUWEN said that after a visit and demonstration by Dr. Oriel he had prepared proteoses from 24 asthmatic patients; 11 of these had given negative skin reactions but the rest had been positive. Different persons reacted differently to the same drug, but it was only when the reaction was extreme that it was termed allergy. He found that those patients who reacted at all to Oriel's proteose also reacted very strongly to 1 in 10,000 histamine. He considered that Oriel's proteose might be responsible for some cases of allergic asthma. Those patients who reacted to human epidermis also reacted to proteose—in other words, they reacted definitely to products of the human body. The allergic patient differed from the normal person in that he was likely to become sensitised to any product capable of provoking sensitisation, provided that he came into contact with it.

t was well known that certain acute infections uld improve the condition of an asthmatic patient ; ong these were lobar pneumonia. erysipelas. amps. scarlet fever. and tonsillitis. Certain other ditions, however. had a harmful influence. and se included influenza. colds, measles. and broncho-eumonia. The problem was to decide what use ald be made of this circumstance. Theoretically. would be to the patient's advantage to induce eumonia artificially. as malaria was artificially luced in the treatment of G.P.I. As this was practicable, some less dangerous and more readily rable disease must be sought. Malaria had little ect in ameliorating asthma, and he had tried ree other diseases. The first of these was dengue. hich he had used in 12 cases. The second was little known disease described in German as *lamm* fever. and which he had translated as slime" fever, since there appeared to be no English uivalent ; this disease was found in Russia and as due to a spirochæte, related to virus disease. at completely harmless. The third disease employed was a certain strain of recurrent fever. ttempts had been made to investigate the influence f these diseases on the blood in asthmatic patients, ore especially on the eosinophil count. and on the cid-base equilibrium or pH of the blood. Most llergic patients and many asthmatics showed osinophilia. It had previously been found that tarvation, and also injections of sulphur in oil, ad an effect in reducing this eosinophilia ; as the emperature rose after a sulphur injection the eosino-hils diminished, and at the same time the amount f adrenalin necessary to keep the patient free from ttacks was much reduced. The rise of temperature ssociated with dengue was found to cause a similar reduction in the amount of adrenalin necessary to prevent attacks, but as a rule had little effect on the eosinophil count. The improvement in the asthmatic condition, however, lasted only two or three days, and infection with dengue showed no advance on the results obtained with sulphur. Slime fever gave sufficiently promising results to make further investigation desirable ; in one case the reduction in the amount of adrenalin necessary to prevent attacks had been very marked. The strain of recurrent fever used was said never to kill any patient, and the improvement produced in some cases had been remarkable. all asthmatic attacks disappearing for months. The patient's sufferings, however. were severe during the feverish attack, and some drug was essential to prevent recurrence. Salvarsan was not effective for this purpose in the artificially induced disease, and another drug not yet on the market. after being employed successfully in 45 cases, failed to prevent recurrence in the final three. Some other drug or some more reliable method must therefore be sought. It was found that these diseases had no demonstrable effect on the pH or CO_2 content of the blood. This form of therapy was chiefly effective in bronchitic asthma. and not the other forms.

Most asthmatics gave a strong positive reaction to tuberculin. and although non-specific therapy of this type was much less dangerous than induced disease, it had met with considerable resistance from the medical profession. If could not cure every patient, of course, but it was capable of producing improvement which might last for months. though it would have no effect if the patient was coming into contact with massive doses of allergin as soon as he left the clinic. Peptone injections. Prof. Leeuwen considered. were not dangerous if given intramuscularly but might cause death if given intravenously. What factor was responsible for the effects of non-specific therapy was still an open question.

CLINICAL EXPERIENCE.

Dr. **C. S. Bruce Pearson** described a positive skin test as a strong. large wheal with pseudopodia and definite persistent erythema. He quoted the results obtained in a series of cases with 0·025 c.cm. of urinary proteose in a solution of 1 in 100,000, which showed that asthmatic patients reacted much more readily and intensely than normal controls. Experiments made with solutions of 1 in 1000 had produced doubtful reactions in some of the normal control cases. There was no sharply defined limit between normal and allergic persons ; most people showed signs of allergy at some time during life, usually in the form of an attack of urticaria.

Dr. **W. P. Stamm** described a case of angio-neurotic œdema in a woman of 48. On Dec. 23rd, 1931, she had developed urticaria, which had recurred daily until Dec. 28th, when she had an acute attack of œdema of the face and lips. She was treated in the out-patient department with intramuscular injections of blood ; fish and meat were excluded from her diet. The œdema disappeared but the daily attacks of urticaria continued, and on Jan. 30th, 1932, she was admitted to the wards of Guy's Hospital. Dr. Oriel had prepared her urinary proteose from a specimen obtained during an attack. She was given a skin test dose with a dilution of 1 in 10,000, which produced a positive reaction at 4 P.M. At midnight she had a severe attack of œdema. On Jan. 15th, 0·1 c.cm. of a 1 in 1,000,000 solution of proteose was given, and again an acute attack of œdema developed at night. On Jan. 18th she was given 0·2 c.cm. of a 1 in 1,000,000 solution. and no reaction followed. From then onwards the doses were repeated at increasing intervals, and she had no further attacks of œdema or urticaria.

Dr. **John Freeman** said that he gathered that Dr. Oriel and Prof. Leeuwen regarded sensitisation to proteose as parallel to sensitisation to some product of a damaged part of the body. He had long thought that sensitiveness to iodide, for example, must be due to a product of iodide with some substance in the body rather than to iodide itself, but this was a long way from the conception that every man was sensitive to his own proteose. He was interested in the use of artificially produced disease as a method of reducing asthmatic attacks. In his experience severe colds had a similar effect, and he had always taken it to indicate that the patient had acquired immunity to some air-passage organisms to which he had previously been sensitive.

Dr. **H. W. Barber** said that he had been using proteose therapeutically for two and a half years. and had come to the conclusion that it was in a different category from non-specific desensitising agents such as T.A.B. and tuberculin. He believed that any psychological effect could be ruled out. It was necessary to find the dose which provoked no reaction and upon which the patient improved ; once found it should not be increased. In many cases the method had failed and had been abandoned. but on the whole he had had better results with it than with any other form of desensitisation which he had used.

Dr. **George Bray** suggested the possibility that reactions to human hair might be due to the presence of dandruff which contained histamine. In America diathermy had been used to produce high temperatures but as soon as the fever disappeared the asthmatic attacks returned. Was there a possibility that proteose treatment would so restore the patient that he could return to his feather bed or to dangerous articles of diet? He thought the best hope of success lay in combined treatment. Some patients were free from attacks on histamine and adrenalin.

Mr. FRANK COKE remarked on the benefit experienced by asthmatic patients during pregnancy, as well as following certain infections. He could not understand how patients could be sensitive to human hair unless it had been changed by mould.

In replying, Prof. VAN LEEUWEN said that hair and superficial layers of skin were taken from the limbs where the presence of moulds was unlikely. Histamine could be prepared from the skin, but the effects obtained with proteose were quite unlike the effects of histamine.

Dr. ORIEL, in his reply, thanked Prof. Leeuwen for the great interest he had shown in the work on urinary proteose.

BRIGHTON AND SUSSEX MEDICO-CHIRURGICAL SOCIETY.

A MEETING of this society on Feb. 4th was devoted to

Backache in Women.

Mr. HAROLD F. SEYMOUR said he thought the condition was less common than it was 20 or 30 years ago, this being due to the much healthier bringing-up of girls to-day. Whilst approving of sports and gymnastics for women, he deprecated excess and said there was a danger of producing a male type of pelvis in young women—with its obstetrical disadvantages—if sport was indulged in excessively. There never could be physical equality between the sexes. His remarks were confined to low backache in the sacral region, and he referred only briefly to gross disease such as large fibroid tumours, incarcerated ovarian cysts, salpingitis, and carcinoma. Where gross pelvic disease has been excluded, he considered there were three main causes of backache—namely, retroversion and retroflexion of the uterus, chronic cervicitis, and prolapse. In the treatment of retroversion pessaries should be used only temporarily. A Hodge's pessary would often cure a retroversion occurring after the puerperium. Persistent retroversion causing backache and other symptoms should be treated by a round-ligament shortening operation. Chronic cervicitis, he thought, was best treated by anæsthetising the patient and deeply cauterising the cervical canal after dilatation. Diathermy too was good, but he preferred the actual cautery. Bad cases not yielding to such treatment were best dealt with by amputation of the cervix. Prolapse, except in a very few cases, was due to injuries to the cervix and pelvic floor during childbirth. He thought it an obstetrical disgrace to allow small women to give birth to large children. Inductions should be done for women with only the bare normal pelvic measurements, where the child was obviously over 7 lb., and so much prolapse would be avoided. Primigravidæ over 40 should always be given the choice of a Cæsarean operation. In the treatment of prolapse pessaries should not be used except as a temporary measure, where it occurred after the puerperium and was simply due to lack of muscular tone. Persistent prolapse should be operated on, and by the vaginal route. The surgical treatment of prolapse was perhaps the most satisfactory of all operative procedures, at any rate it gave the patient complete satisfaction. She felt after the cure of her prolapse that she had returned to the time when she was a nullipara. He hoped the profession would point out the advantages of the vaginal operations for prolapse, and not let women go on wearing insanitary pessaries for years and years, when they could be made clean and well by an operation which cured their backache too.

Mr. RALPH BROOKE suggested that 80 per cent. of cases of low back pain were gynæcological in origin, and the remaining 20 per cent. orthopædic. He pointed out that in the female the posterior pelvic or sacro-iliac joints remained comparatively lax throughout life—an adaptation to function, the important female function of parturition. Sacro-iliac disorders occurred far more commonly in the female sex and at a period when the joints were most movable. Pregnancy had a great influence on the sacro-iliac diseases and injuries, owing, amongst other things, to the increased mobility of the joint at that period. At term the range of movement was increased approximately two and a half times above the maximum in the non-pregnant woman. The return of joint stability of the pelvic joints was closely related to the normal uterine involuntary changes, and uterine subinvolution was associated with a persistence of the lax conditions of these joints which was present at term. The practical application of this was seen in women who rose too early after the labour, which was complicated by uterine subinvolution. In these cases low back pain, other than uterine in origin, was a persistent symptom. Disparity between the size of the fœtal head and the maternal pelvis was another cause of disturbance in the normal anatomical and functional state of the pelvic joints, and the passage of an abnormally large head through the pelvis might lead to over-stretching of the sacro-iliac ligaments with the associated symptoms of joint strain, followed later on by those of a partial subluxation or a secondary traumatic arthritis. Partial subluxation of the joint might occur in women after pregnancy, and was usually traumatic in origin. Radiography was not of great assistance in the diagnosis of partial sacro-iliac subluxations or displacements. Arthritic changes could be demonstrated with greater certainty. Joint laxity might be treated by means of a light brace, or in less severe cases, a strong corset. Manipulation under anæsthesia was useful both as a curative measure in cases of partial subluxation, or when the pathological change was in the nature of a peri-arthritis. It was also useful in the differential diagnosis of strain and subluxation from early arthritis. In the latter a temporary increase in the amount of pain resulted from the manœuvre, but this was easily controlled by a light brace with a pelvic band and sacro-iliac pads. Operative fixation was not on the whole indicated, and should be regarded as a last resort when all other measures had failed.

Much could be done to prevent the many years of intractable backache and pain which many women suffered after pregnancy, if the period of rest in bed after childbirth was governed by the state of the pelvic joints. Persons suffering from delayed involution of the uterus required a much longer period of rest in the horizontal position. The same thing applied if the child was of large size, or the head showed marked moulding.

REVIEWS AND NOTICES OF BOOKS

Traité de technique opératoire oto-rhino-laryngologique.

By GEORGES PORTMANN, Professor in the Faculty of Medicine of Bordeaux. Paris: Masson et Cie. 1932. 2 Vols. Pp. 865. Fr. 250.

WITH the collaboration of his assistants in the Clinic at Bordeaux, Prof. Portmann has produced a valuable treatise on the operative surgery of the ear, nose, and throat. The text is laid out in tabular form arranged under the headings of indications, preparation of the patient, anæsthesia, instruments, and technique. While this makes the description of the actual operation clear and easy to follow, so condensed a method is less suitable to the discussion of the indications for an operation, the advisability of which in any individual case may be doubtful. The work begins with a description of general principles, and of the arrangement of the operating theatres, and includes an illustrated account of the theatres in Prof. Portmann's clinic. Details such as methods of illuminations are discussed, and the so-called diathermy knife is described. The method of diathermic coagulation which is in more general use in this country is not mentioned; presumably Prof. Portmann does not employ it.

The greater part of the first volume is occupied by operations on the ear, and includes a chapter on antrotomy in infants and one on the "conservative" mastoid operation; for the last named operation the indications are said to be very restricted. Curettage of the jugular bulb is advised when incision of the lateral sinus downwards fails to reach the blood current, and ligature of the jugular vein in all cases of involvement of the lateral sinus is regarded as a necessary complement to opening the sinus. The second volume is occupied by operations on the nose and throat. Prominence is naturally given to the treatment of tumours of the nasal fossæ and its accessory cavities by the transmaxillo-nasal route, designed by Prof. Moure, the author's predecessor in the Clinic at Bordeaux. Prof. Portmann describes his practice in connexion with the operative treatment of suppuration in the accessory nasal sinuses. In the operation on the maxillary antrum by the canine fossa route, he recommends a thorough curettage and the removal of the entire lining of the cavity, which is then swabbed out with 10 per cent. solution of chloride of zinc; he respects the inferior turbinal for fear of subsequent atrophic rhinitis. In operating on the frontal sinus, Prof. Portmann makes a wide removal of the anterior wall in order to treat its mucosa in the same way, and he introduces a packing of iodoform gauze from the sinus into the nose to maintain the permeability of the ostium. For tonsillectomy in children he employs the guillotine, describing the operation as that of Sluder-Ballenger: but he uses the finger, and not the eminence of the mandible, to push the tonsil through the ring, according to the method first described by Whillis and Pybus of Newcastle. For adults he uses dissection and snare, and ligatures bleeding vessels: he does not give details of how the ligatures are tied. Of the laryngeal operations, thyrotomy is described with removal of part of the thyroid ala as advocated by StClair Thomson; when a portion of the cricoid is also excised, the operation is described as a partial laryngectomy, but it is acknowledged that there is but a small difference of degree between the two procedures, and that no formal method exactly is suitable to every case. Total laryngectomy from below is the only method discussed, Glück's method of extirpation from above not being mentioned. The outstanding feature of the work is the illustrations, of which there are 467 in addition to two coloured plates. In connexion with many of the major operations photographs are shown of the surgeon's and assistant's tables, laid out with the instruments required; these are often nearly identical, for the same instruments are used in many similar operations and larger figures to show the details of the less known patterns would have been more useful. Most of the illustrations however are full-page plates depicting the various stages of operative procedures; beautifully drawn and reproduced, they give so clear a conception of the operations that further explanation is hardly required, although a short description is appended to each plate. There is no index, and a table of contents only at the end of the second volume.

Prof. Portmann has not attempted a systematic exposition of all the operations of surgery performed in this field, but has only set out to describe those practised by himself: the work will none the less be a valuable guide to those embarking on this specialty.

A Text-book of Surgical Pathology.

By CHARLES F. W. ILLINGWORTH, M.D., F.R.C.S. Edin., and BRUCE M. DICK, M.B., F.R.C.S. Edin. London: J. and A. Churchill. 1932. Pp. 677. 36s.

THE title of this work makes us regret the sonorous and dignified days of our ancestors, one of whom might have published "A Treatise on such aspects of the Science of Pathology as are of peculiar interest to those who practise the Art of Surgery." Other times, other titles, and we have no doubt that within a few months Messrs. Illingworth and Dick's book will be recognised, if not by all those who practise surgery, at least by most of those who aspire so to do, as containing an admirable presentation of that part of pathology which it is of most service for them to know.

The book differs from others of its kind in that some knowledge on the part of the reader of the basic processes of pathology is assumed, and the usual chapters on inflammation, injury and repair, gangrene, and so forth are omitted. There are, however, brief chapters on shock, burns, the pathological effects of irradiation, tuberculosis, actinomycosis, ærogenic infections, and echinococcus disease, though syphilis, streptococcal and staphylococcal, and other common infections are not specifically dealt with. And there is a chapter on the general pathology of tumours which contains far more than is usually included in work of a general character. The great bulk of the book is devoted to the lesions of the various systems which are related to surgery. The subject matter is well chosen and attractively presented, and the teaching is essentially modern. There are upwards of 300 illustrations of naked-eye and microscopic preparations including several radiograms. For the most part they are excellent but a few are below the general standard, rather because they have been ill-chosen than because they are poor reproductions. Fig. 58, for example, does not give a true impression of an osteoclastoma; nor does Fig. 165 represent an average epithelial odontome. Here and there occur a few statements which no doubt will receive further consideration in future editions—for instance, is it correct that the lungs are only rarely infected *primarily* by the *tubercle bacillus*? And is it true (p. 50) that hypernephroma occurs in fused or malformed kidneys? At any rate, this phenomenon is not referred to later in the book where these tumours are described in detail. Stronger exception might be taken to the author's conception of the tumours derived from the skin and other parts of the body covered by similar epithelium. The separation of the basal-celled carcinoma (rodent ulcer) from the squamous carcinoma by the group of glandular carcinomata (pp. 67 et seq.), the statements on p. 354 that a malignant change may supervene in a basal-celled carcinoma (rodent ulcer), and on pp. 588–89 that an epidermoid carcinoma of the pelvis of the kidney is so called because it has a certain similarity to carcinomata of the skin or mucous membranes, tend to perpetuate a state of confusion about these tumours which is unfortunate and unnecessary. The general format of the book leaves nothing to be desired, and the price is reasonable.

Ultra-violet Therapy.

A Compilation of Papers forming a Review of the Subject. By AUSTIN FURNISS, L.R.C.P., L.R.C.S., L.D.S., D.P.H. London: William Heinemann (Medical Books), Ltd. 1931. Pp. 365. 12*s.* 6*d.*

SOME of the papers collected by the author in the present volume have previously been published in medical journals. Presented now in book form they give a fairly comprehensive and up-to-date review of the whole subject of actinotherapy. The treatment of the subject is elementary throughout, but the facts are carefully presented and well documented with references to the more important work carried out by research workers in this country and abroad. Like other books intended for both doctors and laymen this volume proves at times irritating to the medical reader. The notes on general medicine and pathology do not credit the reader with even an elementary knowledge of the subject, while such brief explanatory remarks cannot be of much use to lay readers. The book forms a good introduction to the study of actinotherapy.

Röntgenuntersuchung und Strahlenbehandlung der Speiseröhre.

By Dr. JOSEF PALUGYAY, Privatdozent für medizinische Röntgenologie; Leiter der Röntgenstation der II. chirurgischen Universitätsklinik in Wien. Vienna: Julius Springer. 1931. Pp. 391. R.M.59.60.

THIS book is an illustration of a method characteristic of German scientific investigators which never fails to arouse wonder and admiration in other countries. The œsophagus is a simple organ with a single function; but on the radiology of the œsophagus alone Dr. Palugyay has compiled a work of nearly 400 pages without repetition or verbosity. He has, he explains, tried to set down the lessons he has learnt in the 12 years which he has devoted entirely to the investigation and treatment of the œsophagus in coöperation with eminent surgeons. He gives considerable space to the methodical correlation of his findings with the known physiology and pathology of the œsophagus and makes an unusually valuable contribution to its normal anatomy and physiology—a vitally important study to which too little attention has been paid. He makes no mention, in the section on the swallowing mechanism, of the negative pressure theory, but the cinematographic diagrams he reproduces seem to confirm this theory. After a long and carefully ordered study of the radiological pathology, based on an exhaustive classification, he deals fully with disease, including a special section on foreign bodies, the results of operation, and operation controlled by radiology. In the therapeutic section the use of radium and X rays singly and in combination is considered. The bibliography is, of course, comprehensive. The illustrations are as good as half-tone reproductions of radiograms can be, but much detail is necessarily lost. The line drawings, of which the book contains a considerable number, are well executed and convey much more information.

The book should be used as a work of reference by all radiologists confronted with specific problems in the investigation or treatment of the œsophagus.

Modern Methods of Feeding in Infancy and Childhood.

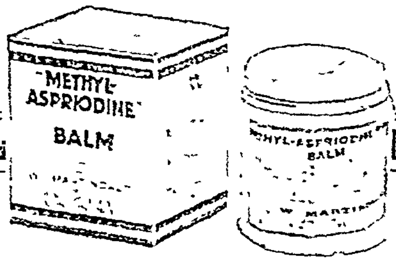
Third edition. By DONALD PATERSON, M.D., F.R.C.P., Physician for Diseases of Children, Westminster Hospital; Physician to Out-patients, Hospital for Sick Children, Great Ormond-street; and J. FOREST SMITH, F.R.C.P., Physician to Out-patients, St. Thomas's Hospital. London: Constable and Co. 1931. Pp. 170. 7*s.* 6*d.*

THIS book has already established its reputation as a guide to infant and child feeding. It is scientific in conception, practical, and easy to read. The third edition is slightly larger than its predecessors; there are few significant alterations, but the text has been rearranged and new tables are included. Some minor changes have been made in the diets recommended for older children, more stress being laid on the necessity for limiting fats. The book is among the best of its kind, and will be useful to *students as well as to practitioners.*

Infection and Resistance.

Fourth edition. By HANS ZINSSER, M.D., Professor of Bacteriology and Immunity, Medical School, Harvard University. London: Macmillan and Co., Ltd. 1931. Pp. 651. 35*s.*

IN the preface to this new edition of his popular text-book Prof. Zinsser expresses the opinion that books on immunology should either be revised every ten years or destroyed (except for a few museum copies). It is eight years since he published his third edition, and it is a matter for congratulation that he has decided in favour of rebuilding as against destruction. The book has been completely rewritten, but by careful pruning and the abandonment of worn-out theories he has made it actually a few pages shorter than before. There has been some rearrangement of the various sections. Special chapters on antigens and antibodies have been added, and hypersensitiveness is now discussed on the definite assumption that this phenomenon in man is essentially *identical with anaphylaxis in animals.* The application of the general principles of immunology to individual infectious diseases is dealt with in a separate section, which include a fair presentation of what is known about immunity to virus diseases. The literature dealing with immunology has become so vast that only those actually immersed in the subject can claim to more than a superficial acquaintance with it. *Prof. Zinsser has produced a balanced* and authoritative review which will continue to be valuable, not only to immunologists, but to workers in other branches of pathology.



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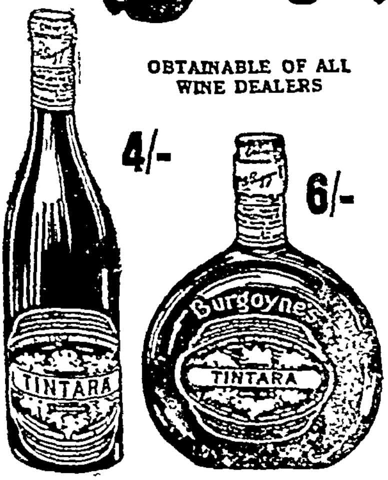

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THE LANCET.

LONDON: SATURDAY, MARCH 12, 1932.

THE LAW OF MEDICAL PATENTS.

THE recent annual report of the Medical Research Council recalls attention to the need of revising the law of patents of medical discovery. The Council's views had already been laid before the Departmental Committee which was appointed in 1929, with a distinguished ex-Lord Justice as chairman, to consider the amendment of British patent law. The Committee, when it reported last year, set forth the Council's recommendations but found itself unable to support them. Concerned, perhaps naturally, with commercial rights, with the standardisation of Board of Trade practice and with the general legal position, the Departmental Committee declined to contemplate any special treatment of medical patents. It was doubtless impressed also with the difficulty of reconciling conflicting interests and opinions. But, whatever the reasons for the Committee's decision on this point, we have to reckon with the fact that, in any future amendment of the law, the Board of Trade is likely to follow the advice of its Committee unless public opinion expresses itself strongly to the contrary.

British patent law took shape 300 years ago. The abuse of prerogative grants of monopoly in Elizabethan times is ancient history. The QUEEN postponed a crisis by one of the ablest speeches ever delivered to Parliament, but a recrudescence of popular grievances caused JAMES I. to bow to the storm. In 1624 the Statute of Monopolies swept away all monopolistic privileges except fourteen-year grants in favour of persons who had invented or introduced a new discovery. British patent law, concentrating upon the three elements of novelty, utility, and inventive merit, has been developed from that Statute. Though patents for projects of alchemy were not unknown, the early law scarcely contemplated application to medical discovery. In 1739, when Parliament was ready to reward JOANNA STEPHENS with £5000 "upon a proper discovery to be made by her, for the use of the public, of the medicines prepared by her for the cure of the stone," a patent could hardly have been deemed appropriate. So far as "the use of the public" is concerned, patent law came a little nearer to our present problem when in 1859 an Act enabled improvements in instruments or munitions of war to be assigned by the inventor, "for valuable consideration or without," to the Secretary of State for War. The next development for our purpose is as recent as 1919. The war had revealed a shortage of medicine and drugs often the subject of patent rights in this country. Section 38 A (2), then inserted in the principal Act, enabled the comptroller of patents to grant licences where patents existed in respect of food and medicine, thus restricting the effect of a monopoly. In settling the terms of the licences or the amount of the royalties, he was to "have regard to the desirability of making the food or medicine available to the public at the lowest possible price consistent with giving to the inventor due reward for the research leading to the invention." This formula bred dissatisfaction because it recognised and encouraged the derivation of private gain from the patenting of medical inventions. The medical profession has its ethical principles and is unaccustomed to the idea that a practitioner should profiteer in respect of a discovery in the medical field. There are no notices in that field warning trespassers that they will be prosecuted. Our research workers have their traditions of publicity and coöperation. But voluntary abstention from patenting has the disadvantage that the results of British medical research may be exploited by others, especially foreigners, who are not amenable to those traditions. And our chemical manufacturers must have some protection. To meet these difficulties a scheme was proposed for the compulsory dedication, in the public interest and under State administration, of all patents for inventions subserving medical purposes. The Departmental Committee weighed the opinions for and against this proposal. The medical profession proved not to be unanimous. Workers in applied pathology and preventive medicine suggested that it was ethically no worse to reward research which reduced human suffering than to give a surgeon or physician a fee for his services. There were manufacturing chemists who declared that medical inventions were already hampered by Section 38 A, and that further restriction would discourage research by commercial firms or, alternatively, would encourage secrecy as a method of monopoly. In the end the Departmental Committee decided against compulsory dedication on the ground that it would operate adversely to the British fine chemical industry and discriminate unfairly against our research workers.

The Medical Research Council's proposal is more sweeping. Aiming higher than individuals' royalties and aware of the traditional disinterestedness of professional ideals, the Council wishes Britain to abolish altogether (as certain other countries have already done) the right of patenting medical discoveries. Obviously, commercial interests will be prejudiced by such abolition unless all the nations agree. Until international agreement is attained, the Council looks not unfavourably upon the dedication scheme; but the legislative amendment which the Council advocates is "the total abolition of the right of patenting in the medical field or some nearly equivalent restriction of that right." The arguments of the Medical Research Council may be briefly repeated. Patent rights exist in order to stimulate discovery. They are not required in the medical field because the worker abjures recourse to patents; he has

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proportions, and that, in particular, the formation of leucocidin is a consistent feature of pathogenic strains. GENGOU lays stress on the fact that it is the filtrate which produces these changes; the dead staphylococcus is harmless when washed, and cannot evoke antibodies of this type. He has further shown that the organism when lysed by bacteriophage is innocuous, and does not produce antibodies of antitoxic value. By using various combinations of organism, lysed organism, and filtrates he failed to protect animals against living staphylococci. It is impossible, however, to neglect the action of these nocuous substances, on whose distinction from each other PANTON and VALENTINE insist, in the production of infection, or to refuse the possible aid of antisera. It is known that the antistreptococcal sera will fail to protect rabbits against eventual death from living cultures; but they will delay it for many weeks. Antisera might thus be expected, in human staphylococcal infections, to convert a lethal infection to a sublethal one; and, above all, to offer a chance of localisation and abscess formation, which is the best prognostic sign in septicæmia. And this analysis of pathogenicity will probably serve in the selection of strains for immunisation of animals, to procure sera with optimum and selective antibody characteristics.

One point, however, is often overlooked in the consideration of pathogenicity of organisms. It is certainly not outside the bounds of possibility that recovery from infection by an organism may be associated with a mutation of that organism, associated with diminished virulence. Such mutations may be imposed by an immune state in the infected individual; and mutation can in fact be imposed in vitro by immune sera. In any epidemic infection, towards the end of the epidemic, cases tend to be less severe. Epidemics do not end with the infection of all susceptible individuals; it is more probable that the virus is attenuated. It is possible that in the future therapy on this basis may be developed; the logical line of advance at present surely lies in the analysis of pathogenic action, and the utilisation of all established specific antibodies with which research workers may provide us. And for their concrete services we can forgive them a great many syllables.

PSYCHALGIA.

QUOTING from lectures given by Sir BENJAMIN BRODIE in 1836, PRATT, GOLDEN, and ROSENTHAL[1] remark that they contain much concerning the neuroses that is not yet generally known by medical teachers and writers. Although BRODIE laid stress on the frequency of pains of hysterical origin, yet nearly all English and American physicians since his time have mistaken for organic disease those cases presenting severe localised pains of psychical nature. The usual false diagnoses are neuralgia, neuritis, or myalgia, though sacro-iliac disease, appendicitis, gall-bladder disease, peptic ulcer, colitis, irritable colon, ovarian neuralgia, and hypertrophic arthritis have played their part. Even in pre-anæsthetic days the patients willingly underwent the horrors of operation, and this fact Dr. PRATT and his colleagues take as evidence that the pain is not only real but very severe—an explanation probably too simple for the psychopathologist, who would attempt to find deeper and unconscious motives at work. After a reference to CHARCOT'S caustic description of surgical intervention in such cases, they note that the development of technique since his day has increased needless operations on the victims of neurotic pain to an extent that no one can measure. A method of demonstrating the psychic nature of these pains was suggested by the work of SOMA WEISS and D. DAVIS on the effect of injecting percaine in the localised area of skin to which pain in visceral disease was referred. This as a rule abolished the pain, but only while the anæsthesia lasted. Used in cases of psychalgia, the percaine gave complete relief in 45 cases, or 83 per cent.; when a sham injection was given in a second group the results were even better, pain being abolished in 93 per cent. The duration of relief followed no rule, but varied from 3 hours to 18 months or longer. Five cases are described in detail, cure being claimed in one patient who had been subjected to 14 operations, including the removal of the appendix and both ovaries and the fixation of a floating kidney. Whether similar results would be obtained by others is uncertain, for the removal of hysterical symptoms by suggestion is haphazard therapy, but the experimenters have proved their point that numerous cases of psychalgia exist unrecognised and that hysteria, as SYDENHAM said, "most frequently occurs of all chronical diseases." They show how this prevalence has been emphasised again and again by various writers (eight are specifically cited) and we venture to doubt whether the failure to recognise it or to make a correct diagnosis in specific cases depends upon lack of knowledge. A recent correspondence in our columns[2] dealt with another aspect of the subject and stressed the need for the consideration of psychological factors by surgeons and gynæcologists; but SYDENHAM, BRODIE, and the others, reached correct diagnoses by methods that are surely still available. The cause of our failures appears to be not ignorance but a mental attitude that has persisted through the years in spite of protests. There must be a fundamental defect in a professional training that makes us ignore the nature of many of the common disorders for which people seek our help, and the remedy seems to lie in inculcating a different attitude rather than in adding to our knowledge.

Manson House, the new headquarters of the Royal Society of Tropical Medicine and Hygiene, will be opened by the Prince of Wales at 5.30 P.M. next Thursday, St. Patrick's Day. The address is 26, Portland-place, London, W.1, and admission to the ceremony will be by ticket only.

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[1] Pratt, J. H., Golden, L. A., and Rosenthal, J.: Jour. Amer. Med. Assoc., Feb. 6th, p. 441.

[2] THE LANCET, 1931, ii., 999, 1157, 1210, 1265, 1324.

always pooled his knowledge gladly and the incentives are not financial. Patent law, it is added, was not meant for discoveries in biology or medicine; biological discovery is often so difficult to define precisely for the purposes of patent practice that there is risk of staking out claims wide enough to limit other explorers unduly. There is a danger too that the patenting of a medical discovery for personal profit will lead to a scramble for proprietary rights in further applications of that discovery where inventive merit may have had no influence or opportunity. The Council has had its own experience of patent rights. It does not desire them for itself. It accepted the British rights in the preparation of insulin in order to secure standard strength and quality and to prevent the marketing of inferior preparations. As soon as the Therapeutic Substances Act was passed in 1925 these objects were secured under Government control and thenceforward the Council made no further use of its patent. A second instance, the Steenbock case, provides the council with an illustration of its argument. With the aid of public money British research produced vitamin D in highly potent form by the ultraviolet irradiation of ergosterol; when our manufacturers were given the chance to apply the discovery, a British patent granted to Prof. STEENBOCK, of Wisconsin, was found to be an obstacle. The Council has published its reasons for saying that this patent is founded on the earlier and unpatented discoveries of various workers, and notably of British workers, and for holding it unreasonable that he should have the power to control the results of so much previous and subsequent work. We have also, it seems, to reckon with patent rights held for profit by foreign universities; the restrictive result is the same whether the proprietor is an individual or a corporate body.

To these arguments, as already stated, the Departmental Committee replies in effect that no case is made out for special treatment of medical patents—the medical field is like any other field and the disadvantages of patents of monopoly are more than offset by increased stimulation of industry and invention. As for the ethical considerations the Committee's attitude is that, if the medical profession has a special code, well and good—let it continue to enforce it. "But we feel strongly that the code should not operate to discourage that full coöperation between laboratory and clinical investigations which is essential to progress in this important field of human welfare." The findings of the Departmental Committee, we repeat, are likely to shape the policy of the Board of Trade; but the commercial aspects of our problem ought not to engross attention in its treatment by Parliament. The Ministry of Health knows that other interests are at stake. The Therapeutic Substances Act, with its Advisory Committee and its statutory machinery for licensing and testing, seems to offer a possible solution. The scheme for compulsory dedication of patents would be strengthened if production under a dedicated patent were brought within the Act. Nothing, however, is likely to be done unless some proposal can be put forward with the reasonable hope of agreement.

STAPHYLOCOCCAL IMMUNITY.

IT has been stated by a medical pessimist, strangely enough a surgeon, that a scientific fact is something determined by experiment which remains true for not less than two or more than five years. It is true enough that science has an uncomfortable habit of development—that the examination howlers of to-day may be the prize-man's answers of to-morrow is in some cases hardly an exaggeration. A new discovery, such as that of the rôle of the staphylococcus in infection, at first seems adequate in itself. But analysis shows the pathogenicity to be complex: and the discovery of each separate pathogenic weapon of the organism only emphasises that other and more important weapons are undiscovered. Immunology to-day has become an awe-inspiring subject. The tendency of bacteria to vary, to produce a large variety of distinct changes on tissues, to evoke a number of specific antibodies, and yet to maintain a fundamentally constant personality, is highly confusing. In time, we may be sure, conceptions will become simplified. All toxins have as much in common as in contrast; antibodies as a class have their similarities. Perhaps in the event the pure chemist, with his analysis of the behaviour of colloids, will reduce all our toxins, hæmolysins, agglutinins, and the rest to simple terms of colloidal structure and aggregation. Meanwhile, we must be content to suppose the existence of distinct causal entities from the study of distinct phenomena, and to leave to the future the unifying conceptions.

Recent work on the staphylococcus emphasises the analytical tendency in immunology. Two facts are quite obvious. The living staphylococcus can kill an animal; and from the staphylococcus substances capable of killing and otherwise damaging animals can be separated. But, although this nocuous power of filtrates has been analysed, and although antibodies can be prepared, it is not possible to protect animals against the living organism, so as to prevent eventual death, by means of antisera. Since, however, it is possible to recover from staphylococcal infections, it follows that immunity is not solely, or even mainly, dependent on the antibodies which have been discovered, and that pathogenicity of the organism is based on elements other than those determined by the most elaborate analysis. The paper by Dr. P. N. PANTON and Dr. F. C. O. VALENTINE in our last issue, and the work of Dr. O. GENGOU,[1] bring the process of analysis one step further. Filtrates of staphylococci will produce necrosis of skin, lysis of red cells, and destruction of leucocytes, and will kill a rabbit. Complete neutralisation of these phenomena can be procured by antisera. It is shown that different strains of staphylococci produce these nocuous substances in different pared for the Metropolitan Asylums Board, now merged into the London County Council, an exhaustive report upon the factors which appeared to be operative in the production of return cases of scarlet fever and diphtheria, and upon the efficacy or otherwise of hospital administrative methods designed to limit their occurrence. This report and a subsequent one to the same authority by F. M. Turner are classical. Although Klein in the 'eighties had described a "Streptococcus scarlatinæ," his work was either not accepted or ignored. Thus Cameron and Turner had not the advantage of bacteriological aid in their investigation of the infecting case of scarlet fever. With the acceptance of the hæmolytic streptococcus as the causal organism of the disease, it is natural that the possibilities of bacteriological control should be explored. Amongst others, U. Friedemann and H. Deicher[1] in Germany and M. B. Kirkbride, M. W. Wheeler, and C. D. West[2] in the United States have already made important contributions to the subject. A more recent investigation is that of J. E. Gordon,[3] of Detroit, who compares the value of bacteriological control in the uncomplicated and complicated case of scarlet fever. He finds that swabbing before discharge to determine the presence of the hæmolytic streptococcus in the throat of the uncomplicated case is not justified by results, as judged by the proportion of infecting cases after release. The uncomplicated case of scarlet fever may be discharged with equal safety after 28 days' isolation with or without swabbing. The infecting case rate was not greater for those proved to be carriers than for those shown to be bacteriologically free. In this connexion it is significant to note that W. Gunn and F. Griffith[4] reported that of 100 consecutive cases of scarlet fever, 49 harboured the hæmolytic streptococcus in the throat and six in the nose at the time of discharge from hospital, and that, so far as could be ascertained, not one of these 55 carriers acted as infecting cases. Kirkbride, Wheeler, and West found that only two out of 34 patients (6 per cent.) who were known to be carriers gave rise to return cases. Friedemann and Deicher[5] record that 100 per cent. of a series of cases were tonsillar carriers of the hæmolytic streptococcus after six weeks' detention in hospital. They seek to explain the low infectivity of the scarlet fever carrier on the grounds that the hæmolytic streptococcus loses virulence and toxicity in convalescence.

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[1] Ann. de l'Inst. Pasteur, February, 1932, p. 135.

In the case of scarlet fever complicated by rhinitis, cervical adenitis, or otitis media terminal swabbing is an undoubted advantage. Gordon found that the bacteriological control of these cases materially reduced the period of isolation, and that the infecting case rate in this group was reduced from 11·9 per cent. amongst those not swabbed before release to 5·5 per cent. when two consecutive negative cultures were demanded. Rhinitis is of outstanding importance as a cause of infectivity: in Cameron's series 50 per cent. of the infecting cases had rhinitis at some time or other; in Gordon's series, although rhinitis and sinusitis occurred in only 14 per cent. of his cases as a whole, the condition was present in 40 per cent. of those which acted as infecting cases. Gordon distinguishes between the infectivity of purulent and catarrhal rhinitis. The hæmolytic streptococcus is present in abundance in the discharge associated with the former condition but is rarely recoverable in the catarrhal form. Cameron made the same distinction based upon observation alone. Cameron was of opinion also that otorrhœa, unless a morbid condition of the nose coexisted, was seldom associated with the production of return cases. The Ministry of Health Report on Scarlet Fever issued in 1927 also expressed doubts as to the infectivity of scarlatinal otorrhœa. Gordon believes that "the patient with suppurative otitis media is scarcely more infectious than the patient released after simple scarlet fever." In some fever hospitals in this country bacteriological control of the scarlet fever patient with complications of a suppurative nature is already being carried out with a view to reducing both the length of stay and the incidence of return cases. Routine swabbing of the uncomplicated case before discharge is clearly not called for. Gordon does not state whether his cases were treated with scarlet fever antitoxin. There is little doubt that antitoxic treatment by lessening the incidence of complications generally also tends to reduce the return case rate.

MORTALITY AMONG SANATORIUM PATIENTS AFTER DISCHARGE.

AN interesting supplement to the studies of Dr. Noel Bardswell and others in connexion with the ultimate fate of sanatorium patients is to be found in a monograph[1] by Dr. F. Lange-Nielsen, published under the auspices of the Norske Videnskaps Akademi and with the financial support of the Nansen Fund. An English summary at the end, and English captions to the tables, do much to illuminate the text, which is in Norwegian. The study does not make cheerful reading. The patients discharged from the public sanatorium of Grefsen in the period 1910–1916 numbered 887 men and 1065 women, belonging chiefly to the working-classes. When the investigation of the subsequent fate of these patients was completed at the end of 1921, only 26 could not be traced. In 1924 Dr. Sofie Tillisch, who had worked as her husband's assistant at the sanatorium, produced a preliminary account of this material which has now been rearranged with the aid of statisticians. While the actual number of deaths was 1056, the number of deaths among the same number in the general population would have been only 88·1. In other words, the mortality among these ex-sanatorium patients was twelve times greater than the normal, and their expectation of life was no better than that of Norwegian males at the age of 80. Yet the average age of the patients on discharge from the sanatorium was only about 28 years. It should, however, be noted that approximately half the patients belonged to the third Gerhardt-Turban stage of the disease, and that the mortality after discharge among the first-stage patients compared with that of the general population was only as 2·7 to 1. From this figure of 2·7, the mortality rose to 7·5 for second-stage patients, and to 27·5 for third-stage patients. In his discussion of his findings Lange-Nielsen draws attention to the remarkably low mortality among first-stage patients during the first year after discharge, and he is inclined to credit sanatorium treatment with a goodly share of this achievement. But in the absence of a similar body of tuberculous patients not given sanatorium treatment, he has been unable to make that comparison which, more than any criterion, would have enabled him to form an

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[1] Deut. med. Woch., 1926, lii., 2147.

[2] Jour. Infect. Dis., 1930, xlvii., 16.

[3] Jour. Amer. Med. Assoc., Feb. 13th, p. 519.

[4] Jour. of Hyg., 1928, xxviii., 250.

[5] Zeit. f. d. ges. Krankheitswesen, 1926, No. 11, p. 333.

[1] Dödeligheten Blandt Sanatoriebehandlede Tuberculöse. By Fr. Lange-Nielsen. Oslo: Jacob Dybwad. 1931. Pp. 49.

ANNOTATIONS

VENTILATION OF ROADWAY TUNNELS.

NAVIGABLE rivers are commercial assets to the districts through which they flow, but they offer barriers to communication between places situated on opposite banks. High-level bridges are of limited application, swing bridges are not very convenient either to vehicular traffic or navigation, subfluvial tunnels have therefore been adopted both here and in America as the best solution of the problem. Two early tunnels of this kind were pushed under the Thames. one at Blackwall in 1897, the other at Rotherhithe in 1908—both at a time when the horse was the principal means of haulage and seemed likely to remain so. The rapid development of internal-combustion engines and steam lorries has complicated the problem of ventilation which was simple enough when only the products of complete combustion. such as occurs in the animal system, were concerned. Natural ventilation has been found inadequate in removing to a safe degree the carbon monoxide. sulphur gases. and free carbon with tarry matter which result from the less complete combustion of fuel in mechanically propelled vehicles. In road tunnels of this kind the need for easy gradients has led to making long slopes on either bank with air shafts at intervals, utilising the caissons used during boring. which convert the tunnel from a simple U tube into one pierced in several places. These communications with the open air serve as inlets or outlets. according to the incidence of traffic, the varying air pressures and differences of temperature within and without the tunnel. Sections of tunnel between them may at times be filled with air which is, if not actually stagnant, at most oscillating to and fro without being drawn out of the tunnel. The products of imperfect combustion are at such times evident. not merely to the chemist, but by their effects on the well-being of those using the tunnel, more particularly those working in it. A further serious source of danger is the fog produced under these circumstances, which adds greatly to the difficulties of driving. In the event of a stoppage, due to a breakdown in the tunnel or to a traffic block at one end, the atmosphere becomes much worse, and serious malaise may be experienced. Tunnels which have been constructed since the advent of the mechanically propelled vehicle have been designed in the hope of overcoming these troubles. The experience of the London Underground railways with one-way tunnels has shown one direction in which improvements can be made. The construction of the roadway as an inner shell. surrounded by outlet and inlet channels for artificial ventilation by fan-driven air currents. ensures safe use even under the congested conditions of modern traffic. But it is one thing to project and another effectively to achieve, and one of the latest tunnels, that under the Mersey at Liverpool. has. almost on the eve of the opening ceremony, been found to have inadequate provision for ventilation.

In the Blackwall and Rotherhithe tunnels much improvement has been effected by the introduction of air at appropriate places. A scheme has been evolved by the engineering staff of the London County Council in collaboration with the chemical branch. and the work is described by Mr. C. J. Regan in a recent report [1] to the chief medical officer. In examining the effect of the progressive installation of currents of fresh air by means of fans, which was started at Blackwall in 1922 and at Rotherhithe two years later, Mr. Regan and his colleagues, on the advice of Mr. J. H. Coste, the L.C.C. chemist, have used Gautier's iodine pentoxide method, as modified by Teague, for determining the carbon monoxide, liquid air employed to remove the traces of hydrocarbon gases—pentane and hexane—which would interfere with the accuracy of the process. Humidity measured by a recording hair hygrometer, supplemented by a standard Assman wet and dry bulb instrument. Owens's air filter was used for measuring soot, and sulphur gases were determined by the Government chemist using a process based on G. H. Bailey's hydrogen peroxide method of oxidation of sulphur dioxide. The question of lead fumes from ethyl-petrol was left in abeyance. Consideration was given to the results of physiological experiments on the effect of carbon monoxide in varying concentration on human beings. In estimating a figure for the maximum allowable concentration of carbon monoxide in a tunnel in which men may be employed on maintenance work for several hours at a stretch, attention was paid to the conclusion of Sayers that long exposure to low concentrations of CO causes far more tissue damage than slight exposure to high concentrations; it was deemed advisable that the CO content should not be allowed to exceed 20 parts per 100,000. The New York State Bridge and Tunnel Commission, it is recalled. first adopted a standard of 40 parts per 100,000, stiffening it later to 25 parts per 100,000. It may surprise many people to learn that the air of busy town streets may contain an appreciable amount of carbon monoxide; Bloomfield and Isbell took 141 samples at peak traffic in 14 towns of the United States, and found average carbon monoxide content of 8 parts per 100,000. Connolly and others examined 690 street air samples in Chicago, of which 85 per cent. gave 5 parts per 100,000 carbon monoxide or less. The average figures varied from 5·3 per 100,000 in busy parts to 1·5 per 100,000 in suburban districts. In central London during the winter Mr. Regan has found an average of 3·4 parts of CO per 100,000. In the tunnels. however, the smoke or fog may become the limiting factor for comfort as soon as carbon monoxide, and the maximum allowable quantity of suspended matter was put at shade 6 of fog samples, being 1·92 mg. of black suspended matter per cubic metre. The highest daily average percentage of humidity of the tunnel air was 88 at Blackwall and 84 at Rotherhithe, and at no time was 100 per cent. reached at either place, clearly indicating that the fogs in the tunnels were not water vapour fogs. Mr. Regan's paper should be read by authorities contemplating the construction of underground garages or car parks, which may become death-traps for those who have to remain there for hours at a stretch, unless care is taken to ensure, under all conditions, an effective removal of products of combustion.

RETURN CASES OF SCARLET FEVER.

WHATEVER the precautions adopted, from 2 to 4 per cent. of scarlet fever patients released from isolation initiate further cases of the disease within, as a rule, a short period of rejoining the family circle. Nearly 30 years ago A. G. R. Cameron pre-research, a definite, rigid procedure was developed: a procedure which in our hands resuscitated 82 per cent. of our 52 cats, and 52 per cent. of our 29 dogs." The order of treatment which was found most reliable in resuscitating animals killed by ether, chloroform, or electric shock is summarised as follows: "Place the animal immediately in shock position. Begin artificial respiration by manual compression of thorax. . . . Apply abdominal binder. Expose and cannulize femoral vein, and inject epinephrin into femoral vein and wash it to the heart by a small amount of glucose." There is no mention in the experiments of stimulation of the heart by puncture of an auricle, a method that was shown in Shipway's paper to be of much value in human resuscitation, and, on the other hand, injection of a drug (epinephrin) is rated at a value which human experience hitherto has rarely corroborated. This very likely depends on the fact that the effective method of washing the drug to the heart which is readily carried out in the laboratory is less likely to be easily applicable in the circumstance of a human patient collapsed on an operating table. Neither the drugs, nor the instruments, nor a skilled person free to avail himself of them may be present under ordinary conditions. The "shock position," by which we imagine is meant a position in which the head is made the lowest part of the patient, seems to be the primary need for the collapsed subject, whether animal or human, whatever subsequent measures are also needed.

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[1] London County Council. Annual Report, 1930. Vol. IV., Part III. P. S. King and Son. No. 2877. 5s.

DANGEROUS DRUGS.

THE results of the Bangkok Conference on opium smoking in the Far East have engaged the attention of the recent session of the Council of the League of Nations. The Opium Advisory Committee was requested to prepare a form of annual report to be made by those governments in whose territories opium smoking is sanctioned, such report is to include particulars of measures taken to discourage the practice, and to cure opium addicts, and statistics are to be furnished giving the consumption per head of "prepared" opium by smokers of different nationalities, and current prices paid for licit traffic therein. Mr. Yen, the Chinese representative, explained that his Government took no part in the Bangkok conference which was convened under Article 12 of the Geneva agreement of 1925, to which China was not a signatory. The reason for such abstention was that the agreement gave no definite assurance that the legalised traffic in "prepared" opium would, within a reasonable period, be brought to an end, as contemplated by The Hague opium Convention of 1912. "China," Mr. Yen said, "remained as heretofore bound only by The Hague Convention, of which she was a signatory, and not by agreements, final acts, declarations or other decisions of the Bangkok Conference." He added that China associated herself with the American observer at the Bangkok Conference in willingness to aid all practicable measures towards suppression of the vice of opium smoking while refusing concurrence with those governments which approved a monopoly system and refrained from attempting prohibition. The report of the Egyptian Government's Narcotics Bureau for 1931 indicates the activity displayed under the direction of Russell Pasha as well as the vast extent of the illicit traffic discovered by the Egyptian police. In 1931, 4327 traffickers and 2882 addicts were arrested, and more than 14,000 kilos of contraband narcotics were seized at the customs in addition to 11,649 kilos confiscated inside the country. On Feb. 17th a new Dangerous Drugs Bill was introduced in the House of Lords to amend the previous Acts of 1920 to 1925 in order to give effect to the provisions of the Geneva Convention (No. 2) of 1931 and thereby supplement The Hague Convention of 1912 and the Geneva Convention (No. 1) of 1925. Numerous additions are made to the preparations of opium and coca alkaloids to which the Dangerous Drugs Act 1920 to 1932 will apply in the event of the Bill becoming law.

EXFOLIATION OF THE LENS CAPSULE.

IT has recently been established that chronic glaucoma in old people is sometimes caused by a degenerative change primarily affecting the anterior capsule of the crystalline lens. Vogt, of Zurich, first drew attention to the condition in 1925 as the result of his observations with the then recently introduced slit-lamp. Other observers, both in his own clinic and elsewhere, followed him, and now Dr. Mohamed Sobhy Bey, of the Cairo Ophthalmological School, publishes a paper [1] on the subject. It appears that in certain cases in old people fluffy whity-blue masses are observed adherent to the pupillary border of the iris or loose in the anterior chamber. These were connected by Vogt with certain changes on the anterior surface of the lens only visible under strong illumination. The changes consist in a faintly opaque central disc and a more peripheral ring of finely granular opacity not continuous with the aforementioned disc but connected with it by faint radial lines. Nine out of the 12 cases observed by Vogt were glaucomatous, and he put forward the hypothesis on clinical grounds that the observed deposits were not inflammatory but degenerated portions of the lens capsule which when they are present in the anterior chamber are apt to produce glaucoma by collecting in the angle and blocking it in the same way that the inflammatory deposits of cyclitis do. During the last six years a certain number of cases showing Vogt's syndrome have been published both from his own clinic and by observers elsewhere, but the subject is somewhat new to English readers. Dr. Sobhy, who was himself a worker in Vogt's clinic at Zurich, has collected over 20 cases seen either by himself or by others of the Egyptian ophthalmic school. He publishes pathological sections of two eyes excised for glaucoma which show the conditions to be just as Vogt described them. It is noteworthy that in one of them although the eye was excised for glaucoma the optic disc showed no typical glaucoma cup. Exfoliation of the anterior capsule appears to be not very rare in old people—17 per 1000 of those over 60, according to the figures of the Zurich Eye Clinic. Of these a considerable number, though by no means all, are affected with glaucoma. It must therefore be recognised as a true occasional factor in causing that disease.

CINEMA WELFARE.

THE national conference that was held at the University of Birmingham on Feb. 27th, under the chairmanship of Sir Charles Grant Robertson, passed a resolution calling on the Home Secretary for a comprehensive inquiry into the arrangements by which films are licensed for public exhibition. In a brief report in our issue of last week (p. 547) the support given to this resolution by Lady Barrett approximately accurate estimate of the value of sanatorium treatment. This study is not a little impaired and rendered to a certain extent academic by the fact that, since the period under review, the treatment patients receive in sanatoriums has undergone far-reaching changes, and sanatorium physicians have learned much before adopting the treatment which is more or less orthodox to-day. Auto-inoculation by exercise under the elusive guidance of the opsonic index has largely been replaced by immobilisation of the lungs by a variety of means and the patient has a much greater chance of benefiting from treatment in the best-managed sanatoriums than he had in the period with which Lange-Nielsen deals.

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[1] Bull. Ophthalmol. Soc. of Egypt, 1931; Brit. Jour. Ophthalmol., February, 1932, p. 65.

VITAMIN STANDARDISATION: STANDARD CURVES OF RESPONSE.

THE establishment of international standard materials for the vitamins A, D, B_1, and C, which was so successfully carried out last summer, has received notice in our columns. A further step forward is shown in Dr. J. H. Burn's sixth annual report of the Pharmacological Laboratories which we have just received from the Pharmaceutical Society of Great Britain. Vitamin estimations can only be carried out by means of experiments with animals, and anyone familiar with the wide variation in response of individual animals in tests of this type will understand how difficult it must be to establish any sort of standard of behaviour. Yet this has now been achieved for more than one vitamin. If sufficiently large groups of animals are used, the average values of their reponses to graded doses of the given vitamin tend to arrange themselves into a regular series; accordingly, when dose and response [illegible] d a curve results which, with [illegible] may be taken to represent a standard curve of response to known amounts of standard vitamin material, against which the vitamin value of unknown substances may be tested. The nutrition department of the Pharmacological Laboratories, of which Miss K. H. Coward, D.Sc., is in charge, has been in the van of this interesting piece of progress, and has constructed standard curves for vitamin A, for vitamin D, and for vitamin C. In the first instance it is the growth response of test animals which has been standardised: in the case of vitamin D it is a particular reaction of the bone by calcification; and in the case of the antiscorbutic vitamin it is a histological change in the teeth of guinea-pigs which has provided the response. Other workers have used the X ray appearance of the bone as the particular form of response selected for standardisation in the case of vitamin D and curves have been constructed both in continental laboratories and in that of the Medical Research Institute at Hampstead. The development is certainly important in bringing vitamins into line with drugs which have to be tested biologically, and further important progress in the same direction is to be anticipated.

PLEURISY AMONG HOSPITAL NURSES.

THE incidence of pleurisy with effusion and erythema nodosum among the nurses in training at an important hospital in one of our dominions caused some anxiety last year. The nurses do a term of duty at a sanatorium, and in the course of their work are also attached to a tuberculosis balcony at the main hospital. The actual percentage affected can hardly be ascertained, since the precise number of women at risk is not available; but it can be estimated approximately from the fact that about 45 probationers enter the hospital and about 25 complete their training, in each year. Among the probationers (about 180 in number) who entered over a period of four years there occurred six cases of pleurisy with effusion. Five out of the six had nursed consumptive patients, and four reported sick between three and 12 months after exposure (one record is incomplete). Most of the girls were country-born, but had attended school in towns of some size. In all cases lymphocytes predominated in the pleural fluid, and in one case tubercle bacilli were found; all underwent sanatorium treatment for some months, with apparently satisfactory results. The incidence was thus something over 3 per cent. among all entering probationers. Records of the incidence of erythema nodosum extend over five years, and thus apply to about 225 women: 10 cases were observed (about 4½ per cent.); 7 of the probationers had completed their tuberculosis nursing, and 6 of these became affected while actually nursing tuberculous patients, sometimes after short periods of exposure—i.e., 13, 12, 10, 8, 7, and 3 weeks. A ward-maid from the sanatorium was admitted to the hospital with the same complaint. In all cases complete recovery occurred and the subsequent health has been good. Whether the figures are so far in excess of the expected rates for pleurisy with effusion and for erythema nodosum that they must be regarded as significant, in the absence of a control group in the same area, is not certain. If the cases of pleurisy with effusion are all presumed to be cases of respiratory tuberculosis, and if they represent the entire incidence of such tuberculosis in the population of nurses, this incidence may not be abnormally high. But that all the cases of respiratory tuberculosis in that population took the form of pleurisy with effusion seems unlikely, though we have no information on this point. A good deal more information than has been supplied to us is required if the incidence is to be regarded as more than suggestive. The exposure to risk in the dominion from which this report comes may differ greatly from that in this country. We trust that a fuller report on the circumstances will be published. The figures are to some extent comparable with those given by Heimbeck in Norway (quoted by Topley and Wilson[1]) who investigated 397 probationer nurses, all of whom were tested with tuberculin. Of these 43, or just over 10 per cent., suffered from tuberculosis (including erythema nodosum) within three and a half years. About half the girls gave positive and the rest negative tuberculin reactions on joining, and it is noteworthy that 40 out of the 43 cases of infection were among the negative reactors.

THE ORGANISATION OF RESUSCITATION MEASURES.

AN article under the above title[2] comes as an interesting complement to the paper read at the last meeting of the British Association by Sir Francis Shipway, an abstract of which appeared in our own columns.[3] The American contribution relates laboratory experiences only, but its authors seek to draw useful conclusions for application in the case of human beings. They say that "since clinical application was the goal of the

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[1] Topley and Wilson: Principles of Bacteriology and Immunity, 1930, p. 831.

[2] Amer. Jour. Med. Sci., February, 1932.

[3] THE LANCET, 1931, ii., 796.

SPECIAL ARTICLES

THE COASTAL HEALTH RESORT:

ITS VALUE AND DEVELOPMENT.

At Hastings last week-end the sun shone brightly at the foundation of the first sectional branch of the new British Health Resorts Association. The founders took the opportunity to discuss the present and future use of the British coast in its relation to health and recreation, and a great variety of opinions found expression.

Medical Aspects.

Dr. W. G. **Willoughby** (medical officer of health for Eastbourne and President of the British Medical Association) took the chair at the first meeting. It was true, he said, that one and a half to two hours more sunshine could be enjoyed daily on the Riviera, but the climate of the southern English resorts was much more equable, and to invalids this was very often an important advantage. Like many subsequent speakers, he felt that far too little systematic work had been done on the reactions of the body to a sojourn at the seaside, and that *too little information* was available to profession and public on the particular uses of particular places in this country.

Dr. E. P. **Poulton** (physician to Guy's Hospital) pointed out that the air in different places had the same composition. But just as patients on hospital balconies ate 50–100 per cent. more than those in the wards, so people at the seaside received a metabolic stimulus. It was hard to say how far the increase of resistance of children at a place like Hayling Island was due to sunshine, and how far it was due to cooling of the skin. It had been noted that at the seaside the temperature of the skin tended to fall, whereas the temperature of the feet rose—a sign of improvement in circulation. The children in question had come from crowded cities and he could not say that the same thing did not happen when they were sent to the countryside inland. At a place like Hastings, however, visitors might have the benefit of sea-bathing, not only in summer, but also, in the warm sea-water swimming-bath, throughout the winter.

RESPIRATORY DISEASE.

Dr. R. A. **Young** (physician to Middlesex Hospital) regretted that even the medical profession knew so little about climatology. It was strange, he said, that only during the last century people came to understand the health-giving properties of change to mountains, moors, and coasts—previously condemned as bleak and dour and deserted. Now, however, these properties were appreciated in almost every country, especially perhaps on the Continent in Holland and France. The marine resorts could, he thought, play a big part in preventing chronicity of catarrhal and chest affections (to which his remarks were confined). After illness of the "influenzal" group a few days' residence at the seaside was capable of restoring vigour and activity, and perhaps even more important was its value in clearing up residual cough. Cough was a symptom apt to recur year after year in winter, and its summer intermission often grew shorter and shorter until chronic bronchitis was continuous throughout the seasons. The sequence could sometimes be broken by spending two or three winters at the coast, preferably arriving at a time when it was still possible to spend much of the day out of doors. Emphysema was also helped by staying at the seaside, but asthma presented a more individual and local problem which needed local investigation. It was often said that the tuberculous should not go to the sea, and it was true perhaps that they should not live at sea-level. But many of the most efficient sanatoriums were on the coast, and great benefit could often be derived at the seaside by patients who would not enter sanatoriums or had been discharged from them, and also by those with tuberculous pleurisy for whom institutional life was often unnecessary. More accommodation should be available for such cases, and to this end the unreasonable fear of contracting infection from the tuberculous should be broken down. Much remained to be learnt about the complex effects of climate, said Dr. Young in conclusion, and there was room for experiment at coastal resorts with such methods as inhalation therapy and compressed air-baths like the one at Brompton Hospital which had proved useful in emphysema and other conditions, yet remained unique, he believed, in England. Doctors at coastal resorts must pool their experience and tell their colleagues elsewhere what patients to send and what patients *not* to send. To send unsuitable cases was bad for the patient, bad for the doctor sending them, and bad for the health resort.

CHILDREN.

Dr. **Leonard Findlay** (physician to the East London Hospital for Children) said that his investigations with the late Prof. Noël Paton had demonstrated the immense importance of environment in the development of children, and also the superiority of country over town. To some extent the difference was due to better maternal care in rural districts, but he had no doubt that fresh air and sunlight played the most important part. These were found at their best on the coast, where the air came in fresh and uncontaminated from the sea. Here the body was readily trained to react to varying conditions, while (as for the mind) there was no place where a child could be so easily entertained—on a playground thoroughly cleansed twice daily. There were opportunities, moreover, for the best form of physical exercise. This was always a bit of a problem in childhood, because its value depended on the vigour with which it was performed, and there must therefore be interest in the movements themselves or the result of their performance. Swimming was ideal, and it should be possible, with warmed and sheltered water, to provide for it throughout the year. For the convalescent, with his lessened power of heat production, there must be sunny playgrounds guarded from the wind—and where better than on the south coast, at the very doors of the largest section of the population of these islands? A stay at the seaside should benefit children convalescing from pulmonary infections and nephritis, and also many with active disease when this was not associated with too great prostration. With tuberculosis of bones or joints, or rheumatism, as good results could be obtained in this country as anywhere—provided sufficient time was allowed for treatment. The doctor must demand one, two, or three years, for often the degree of success varied with the length of treatment. Usually special accommodation was required, but in the less severe cases much could be done with spinal carriages. Room and protection should be found for these on the sea-front, and easy paths should be available for them. The fear of infection of other children was

Dr. W. A. Potts, and other medical speakers was duly noted. The conference was convened by the Birmingham Cinema Inquiry Committee, which came into being about April, 1930, owing to dissatisfaction (to use a mild expression) with the prevalent type of film, and particularly with the baneful effect of that type on children and adolescents. The promoters of the Birmingham movement maintain that this great instrument which modern science has given to the world can be, indeed is bound to be, a tremendous and inexhaustible source of recreation and education, and for that reason they are determined to persist in their endeavour until its abuses and dangers have been extirpated. Members of the committee have made it part of their work to investigate the influence of the cinema upon children themselves. The picture-houses which the children chiefly frequent were attended regularly for a period of nine months by investigators who sat with the children, talked with them, and watched closely the effects of films upon them. Their results were embodied in a report of great interest issued early last summer.[1] We understand that the general feeling at the conference was that similar inquiries should be undertaken in other centres outside Birmingham. Dame Ethel Shakespear suggested that the conference should appoint seven of its members to act as a standing committee with powers to coöpt others, but a subsequent proposal made by the National Council for Mental Hygiene appeared to be more acceptable to the delegates present. This proposal was that each centre should create its own local committee, and that a national committee should be formed representative of the several local committees. If the proposal matures we should like these bodies to be known as Cinema Welfare Committees, with a constructive rather than a merely destructive outlook.

THE ROYAL SOCIETY

THIS year, for the first time, the Council of the Royal Society has been charged to recommend 17 instead of 15 candidates for election; the great increase in the range of scientific effort throughout the Empire more than justifies the innovation. Among those recommended our readers would be especially gratified to observe the following names: Dr. J. B. Orr, the director of the Rowett Institute, Aberdeen, who has carried out important researches on protein metabolism, on respiration, and on the influence of vitamins and mineral constituents upon normal metabolism and disease; Dr. Warrington Yorke, professor of tropical medicine at the University of Liverpool, is distinguished for his researches on trypanosomiasis and its transmission, and on hæmoglobinuria; Dr. Davidson Black, professor of anatomy at the Union Medical College, Peking, is distinguished for his researches in comparative neurology; Dr. F. R. Miller, professor of physiology at the University of Western Ontario, has also devoted himself particularly to the study of the nervous system; Prof. F. C. Bartlett holds the chair of experimental psychology at Cambridge, and his publications embody much original research in this comparatively new field; and Mr. J. B. S. Haldane, Sir William Dunn reader in biochemistry at Cambridge, has contributed to our knowledge of acid-base equilibrium in man, and his work has had important bearings on therapeutics. Among others less directly concerned with medicine we have to welcome the names of Mr. F. E. Fritsch, D.Sc., professor of botany at the University of London, who is the principal British authority on the fresh-water algæ; Prof. J. A. Gray, who is the Chown research professor of physics at Queen's University, Kingston, Ontario, who has made important advances in the study of radioactivity; Mr. R. D. Hartree, Ph.D., who holds the chair of applied mathematics in the University of Manchester; Mr. Karl Jordan, Ph.D., director of the Zoological Museum at Tring, whose work is mainly on the taxonomy and anatomy of insects; Mr. J. L. Simonsen, D.Sc., who holds the chair of chemistry in the University College of North Wales; Mr. Thomas Smith, head of the optics section of the National Physical Laboratory; Prof. H. W. Turnbull (St. Andrews), who is distinguished in mathematical research; Mr. F. W. Carter, Sc.D., who has materially advanced the foundations of electrical engineering; Mr. W. G. Fearnsides, Sorby professor of geology at the University of Sheffield; Sir Basil Mott, President of the Institution of Civil Engineers; and Mr H. S. Taylor, D.Sc., professor of physical chemistry Princeton University, U.S.A.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDE FEB. 27TH, 1932.

Notifications.—The following cases of infectio disease were notified during the week:—Small-po 73 (last week 72); scarlet fever, 1429; diphtheri 908; enteric fever, 35; pneumonia, 2158; puerper fever, 39; puerperal pyrexia, 121; cerebro-spin fever, 62; acute poliomyelitis, 7; acute poli encephalitis, 1; encephalitis lethargica, 17; continu fever, 1; dysentery, 44; ophthalmia neonatorum, No case of cholera, plague, or typhus fever w notified during the week.

The number of cases in the Infectious Hospitals of t London County Council on March 1st–2nd was as follow Small-pox, 116 under treatment, 2 under observation (l week 129 and 10 respectively); scarlet fever, 127 diphtheria, 1544; enteric fever, 13; measles, 15 [illegible] puerperal fever, 21 (plus 10 babie [illegible] 3; "ot [illegible] there were babies (plus 10 mothers) with ophthalmia neonatorum

Deaths.—In 117 great towns, including Lond there was no death from small-pox or enteric fev 64 (20) from measles, 9 (2) from scarlet fever, 48 from whooping-cough, 44 (8) from diphtheria, 53 (from diarrhœa and enteritis under two years, a 324 (47) from influenza. The figures in parenthe are those for London itself.

The reported deaths from influenza have not risen furt Of the great towns Sheffield stands highest with 18 deat followed by Leicester with 15, Bristol with 12, Birmingh and Great Yarmouth each with 11, Bradford and Nor ampton each with 10. The total deaths for the year fr influenza so far amount to 2656, compared with 2625 the corresponding period of 1931. Manchester ag reported 6 deaths from measles, Dagenham 4. Whoopi cough claimed 8 victims in Liverpool, 7 in Birmingh Liverpool reported 8 deaths from diphtheria, Salford 3

The number of stillbirths notified during the we was 307 (corresponding to a rate of 45 per 1 births), including 54 in London.

CHRISTIE HOSPITAL, MANCHESTER.—The funds the Christie Hospital (cancer pavilion an home), Manches have been depleted by £45,000, the cost of the and the erection of the new hospital at Withingt By the time the buildings are completed not more t £10,000 of endowment will remain; the investment inc will thus be reduced from over £6000 to barely £20 Since the new hospital will have 101 beds, more than tr the present accommodation, a much larger income be needed, and an appeal is being made for at l £150,000.

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[1] See THE LANCET, 1931, i., 1409.

mmission's recommendation that there should be eparate licence for hotels and restaurants as opposed public-houses.

Mr. **Clough Williams-Ellis**, F.R.I.B.A., gave an static account of the ideal seaside pavilion and the eal wet day to be spent in it. Combining the ntheon of the gods of gaiety with what the Russians ould call a "home of pleasure and culture," the ilding offered all possible amenities amiably eltered under one hospitable roof, and its master ceremonies was an ex-ambassador who had lost is job through devoting his despatches to reports galas and fêtes. From the planetarium to the nnicipal creche Mr. Williams-Ellis outdistanced e Arabian Nights, and he was certainly right in ying that the first town to put up his pavilion would ave many visitors.

Mr. **Marshall Sisson**, A.R.I.B.A., showed pictures f what had already been attempted in this direction, hiefly abroad, and also showed his own design for a easide recreational centre.

The British Health Resorts Association.

Dr. **Willoughby** said that no existing organisation epresented the medical point of view. The spas ad set a good example in collating and systematising he information at their disposal. There was no wish to decry the value of foreign resorts, of which all were aware, but it was probable that the value of our own watering-places had hitherto been understated.

Lord **Meston** said that at the present time there was one export for which there was little or no justification—namely, the export of our own people and money. Was it true, he asked, that other countries had better facilities for cultivating health? This was the question to which the Association set itself to give a negative reply.

Colonel **Elliot** said that the movement had for the first time the unanimous backing of the medical profession, and this could only be retained if it was free from commercialism. He did not know where the movement would lead, but the motto all through would be "Britain first." For the present the British Health Resorts Association was concentrating on the coasts, "but if the spas think we can help them there is nothing we should like better."

Dr. **Fortescue Fox** (chairman of the medical advisory committee) expressed his interest from the purely medical point of view. No organisation had addressed itself in a serious and orderly way to the science of health resorts, and he had reluctantly come to the conclusion that they had gone as far as they could on an individual basis. The problem was a national one to be tackled in a coöperative spirit, and the help of any other organisation would be welcomed. In such a body efficiency must ultimately depend on the peripheral nervous system—the sense-organs and end-organs—and he appealed for the assistance of medical men at the coast.

Resolutions were passed providing for the establishment of a south-eastern region (southern section) branch of the Association, and a local council for Hastings, both medical and lay, was nominated as one of the constituent parts.

The Conference.

Throughout the week-end the conference received the greatest possible hospitality from the local municipalities, hotels, hospitals, and medical men. The Mayor of Hastings welcomed the members at a banquet in the Queen's Hotel on Friday night, and threw open the resources of the town to the visitors. On Sunday three of the leading hotels of Eastbourne entertained 120 guests at luncheon at the Grand Hotel, where speeches were made, among others, by the Mayor (Councillor Lachlan MacLachlan) the medical officer of health (Dr. Willoughby), and Prof. J. D. Stanley, of Birmingham. Here, too, Sir StClair Thomson gave the second of two speeches which will long be remembered by those who heard them. Finally, at Bexhill, on Sunday afternoon, the Mayor (Mrs. C. I. Meads) gave a tea-party in the Granville Hotel, and gracefully provided a christening cake for the Association.

THE LANCET COMMISSION ON NURSING.

(Concluded from p. 534.)

Collected Recommendations.

The recommendations contained in the Final Report,[1] which were signed by all the Commissioners, are as follows:

THE GAP.

I. Conditions of service in the nursing profession should be altered in such a way as to attract a far larger proportion of those girls who in any case will stay at school till they are 18.

II. An extensive trial should be made of combined scholarship and maintenance schemes throughout the country for girls of 16 upwards, with possible extension of such schemes to girls of 14. (See para. 71.) These girls should be chosen, not solely on examination results, but taking into consideration other factors, such as the record and interests of the girl, and probable suitability for nursing. These schemes would be rendered more effective by periodical visits of parties of school-girls to hospitals in their neighbourhood. Such visits would awaken their interest and encourage them to apply, where necessary, for maintenance grants, which could be allocated in accordance with the principles set out in proposition (2) in para. 93.

III. The curriculum in these scholarship courses should be general rather than special until the girl has reached 16 or 17, and after 17 anatomy, physiology, and hygiene could be introduced in direct preparation for the first part of a divided Preliminary State examination.

IV. Encouragement should be given to girls who have left school and are occupied in shops or offices during the day to study anatomy, physiology, and hygiene in evening classes in polytechnics, technical schools, and evening institutes, and to take the proposed Part I. of the Preliminary State examination. The same classes could be attended by girls over 17 who are working in various departments of hospitals or in convalescent homes, and possibly by first year nurses at Affiliated, Associated, or Reciprocal hospitals.

COST OF TRAINING.

V. Hospitals should recognise that the nurses are paying indirectly, if not directly, for their training, and that the onus rests on the hospitals to provide good facilities for such training, including expert instruction during hours on duty. To this end a practically baseless, and the public must learn that there was no danger in using a health resort both for the sick and healthy.

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[1] The Report may be obtained from The Lancet Office, 7, Adam-street, Adelphi, W.C.2, for 2s. 6d., post free 2s. 9d., or through any bookseller.

NERVOUS DISORDER.

Dr. **Wilfred Harris** (physician for nervous diseases, St. Mary's Hospital) said that victims of worry were usually best treated in an environment totally different from that of their homes. Some should be sent far away, but the large majority could be looked after most satisfactorily in this country. The south coast was a valuable terrain for these cases. An important advantage was the possibility of easy coöperation with local hospitals and medical men, which avoided the cross-purposes and difficulties that often arose abroad. A further advantage was that the journey was short, without risk of infection in Purple Train or Diamond Aeroplane. But if the best use was to be made of the opportunities a good deal of organisation was necessary. Much had been done for instance at Hastings, but he would like to see further development of the medical baths, together with provision of a solarium and manipulative treatment for wasted muscles. Among the therapeutic agents which might be useful in nervous disorder Dr. Harris included ice-rinks, winter-gardens, dancing-floors, golf-courses, and "mild gambling." He thought it would be hard for English resorts to compete with those abroad unless the present interferences with personal liberty were somewhat relaxed.

Dr. Harris disagreed with Dr. Poulton's statement that air everywhere had the same composition, and Dr. Poulton qualified it by explaining that while the proportion of oxygen was everywhere about 20·93 per cent., what was more important was its partial pressure, which varied with moisture, barometric pressure, and temperature.

LOCAL OBSERVATIONS.

Dr. G. R. **Bruce** (M.O.H. for Hastings) said that each year 7000 or 8000 people passed through the 25 or 30 convalescent homes in the town. Experience at the two tuberculosis hospitals, Eversfield and Fairlight, showed that early tubercle did extremely well in the locality, while cases in private nursing homes and rooms could have excellent medical care. Among conditions successfully treated at Hastings he mentioned especially catarrhal infections, asthma, nervous debility and dyspepsia, and post-operative convalescence.. Hitherto the benefits of convalescent homes and the like had been mainly offered to the working classes, but the British Health Resorts Association wanted to extend them to the middle and professional classes by making available in hotels and lodging houses the accommodation and diets suited to invalids.

Dr. **Hill Joseph** said he had been 34 years at Bexhill, and could recommend it for cases of insomnia, Graves's disease, surgical tuberculosis, very early phthisis, chronic bronchitis, anæmia, and cardiac disease when not too advanced. But it was no use sending a person to the seaside unless he could stand some exposure to wind.

Dr. **Percy Lewis**, of Folkestone, said that all the towns in the area had the advantage of shelter from east and north winds. He pleaded for closer study of physiological reactions at the seaside on the lines of Häberlin's investigations at Wyk-auf-Föhr.[1] Just as a plant might wither on sudden removal from the conservatory, so delicate children might easily be the worse for sudden exposure at the seaside, with more food, excitement, and exercise, and a longer day. Acclimatisation at Folkestone took about a month, but at the schools it was found that during the first year the children always relapsed in the holidays. It was best to arrive at the seaside school at the beginning of the summer term.

Dr. J. R. **Dingley** (medical superintendent of Robertsbridge Sanatorium) pointed out that some patients required stimulation and others shelter. Children suffering from undernourishment and over-clothing usually flourished when their clothes were removed; on the other hand, elderly people with bronchitis and asthma also did very well in the locality if they took reasonable precautions. This was essential, for worse than to send unsuitable cases to the seaside was to send them to a doctor who would not give the necessary supervision. In chronic tuberculosis the place of treatment was not so important as the discipline.

What the Visitor Wants.

"You can't get people to go to places where they won't be amused and interested," said Lieut.-Colonel R. H. **Elliot**, F.R.C.S. (chairman of the executive committee of the Association). "They won't go; they won't stay; and if they do stay they'll never come back." They did not ask for haunts of vice or for gambling-halls, but they did want reasonable amusement. It was a great pity that the health resorts should not encourage their visitors' interest in the archæology and bird life around them—to give but two examples.

Lord **Meston** (chairman of council of the Association), who presided over the second session of the conference, spoke of the elaborate organisation which looked after patients going to foreign resorts; they were cared for from the moment they started, and were made to feel that someone was in charge of them. In this country, however, "having made up your mind that you're going to any particular watering-place, you've got to fight your way to it, fight your way into it, and fight your way *to a cure*."

Sir **StClair Thomson** touched on the same point in his speech at the banquet given by the town of Hastings on Friday night. "Non curatur quis curat," he said; you cannot be cured if you are worrying about your health. The basis of French civilisation was good food and good manners, and even in small French hotels one would often find central heating and hot water in every room. The English coast needed to follow this example so that the visitor could always be warm and comfortable and well fed.

Mr. R. C. **Vaughan**, describing hotels as "the heart of every holiday," said that in England they were rapidly improving. At a census as *long ago* as April, 1930, there were over 500 country hotels with hot and cold water in every bedroom. The real trouble in maintaining good accommodation at the seaside was the shortness of the season, and he hoped the Association would prove that nearly every coastal town was healthy nearly all the year. Municipalities forced up hotel prices by levying heavy rates, and at Bath the hotel managers complained that visitors were discouraged by high medical fees! As for Dora, would it not be possible to have a lighter touch on our sunny seashores? "Can't we allow them to be just a little gay?"

Mr. L. A. **de L. Meredith**, speaking at the banquet, said that the Travel Association, of which he is secretary, would urge fulfilment of the Licensing

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[1] Brit. Med. Jour., 1931, ii., 331, 348; see THE LANCET, 1931, ii., 37.

xxxv. Off-duty time should be arranged in advance,) that the probationer knows *at least* a week before-and between what hours she will be free on a given ay.

xxxvi. A probationer on day duty should be free o go out between the time she comes off duty and edtime without special permission.

xxxvii. Some measure of telephone facilities should e provided, and where possible reception rooms for uests should be available in the Nurses' Home.

xxxviii. Attendance at meals adjacent to off-duty ime should not be compulsory.

xxxix. Not less than three weeks' annual holiday hould be allowed.

Trained Nurses.

l. Sisters and staff nurses should be given improved onditions of service, on lines suggested in paras. 68 and 269.

li. Where the provision of fresh accommodation for nurses is under consideration, the possibility of giving some of the nurses the alternative of living out by the offer of non-resident allowances should be explored.

lii. Efforts should be made to attract girls with administrative ability into the profession.

liii. Posts as staff nurse should be reserved for fully trained nurses.

PROFESSIONAL EDUCATION.

xl. The *Preliminary State examination* of the General Nursing Council should be divided into two parts: Part I.—Anatomy, Physiology, and Hygiene; and Part II.—Theory and Practice of Nursing.

xli. Part I. should as a rule be taken before, but not more than two years before the nurse enters the wards. If a hospital wishes to admit a girl who has not taken Part I., or has failed in Part I., this should not be forbidden, provided that she is not admitted to lectures in medicine and surgery, or to Part II., before she has passed Part I. A girl who had taken Part I. more than two years before she entered hospital might be required to take it again.

xlii. The General Nursing Council should recognise as centres where the lectures for Part I. can be given, any institutions, including secondary schools, where adequate arrangements have been made to give this tuition, and in which the tuition provided is not inferior to that provided at hospitals approved as Affiliated, Associated, or Reciprocal hospitals. The lectures should be given either by a medical man or woman, or by one who holds a university degree in these subjects, or a certificate from one of certain specified physical training colleges.

xliii. The General Nursing Council should exempt from any subject in Part I. anyone who holds a university degree which includes that subject, or has passed an advanced examination in it—e.g., an Intermediate examination in science.

xliv. Questions in the *Final State examinations* for all parts of the register should be confined to nursing treatment, and should not involve systematic medicine, surgery, gynæcology, or psychiatry.

xlv. Hospital authorities should assume responsibility for releasing a nurse from duty at least on the day before, as well as on the day of, her final written and oral examinations.

xlvi. Sister tutors should be provided in the proportion of not less than 1 to every 60 nurses in training.

xlvii. Sister tutors should not be required to undertake any duties other than those connected with education.

RECOGNITION OF PREVIOUS TRAINING.

xlviii. The General Nursing Council should empower all hospitals approved as complete training schools giving a three years' course to make an allowance for time spent in any other approved training school, provided satisfactory evidence of such service is produced.

DOMESTIC WORK IN HOSPITALS.

xlix. A redistribution between nurses and ward-maids of the domestic work in the wards of hospitals is urgently required. We recommend the provision of sufficient ward-maids to relieve nurses of domestic duties not directly concerned with the patient.

STAFFING OF NON-APPROVED HOSPITALS.

liv. Hospitals which are not approved by the General Nursing Council should not seek to enlist probationers for training, but should be staffed by trained nurses and domestic workers.

TUBERCULOSIS HOSPITALS.

lv. In the Supplementary part of the register containing the names of nurses trained in the nursing of persons suffering from infectious diseases, a special section should be included in which should be placed the names of nurses trained in the nursing of patients suffering from tuberculosis.

lvi. Higher pay, greater amenities, and long holidays should be offered in connexion with work in sanatoriums.

MENTAL HOSPITALS.

lvii. The filling of ward sisters' and higher posts by nurses who have had a general as well as a mental hospital training is desirable. Greater facilities for fully trained mental nurses to take a two years' course in general hospitals are urgently required.

lviii. The provision of teaching, and accommodation for study, should be adequate; and probationers should be encouraged to undergo progressive training. Hospitals which have sought and obtained approval by the General Nursing Council as training schools should provide teaching for the State examinations.

lix. Special care should be taken that young, inexperienced probationers do not begin their work in wards where the patients are likely to be abusive, noisy, or violent.

lx. The stretch of work during which no meal is provided should never be as long as 7 hours.

lxi. Advertisements should show clearly what is the net salary offered at the time of appointment, and nurses in hospital should be furnished on pay-days with a statement showing the gross amount due to them and the deductions which have been made.

The Conclusion to the Report.

In concluding this survey it will be well to repeat what was said in opening it—that it has been restricted to a search for causes remediable within the limits of the present system of hospital staffing without fundamental change. Within these limits it has revealed many differences in the existing practice of hospitals. It has revealed inequalities of pay and conditions where duties and responsibilities are not dissimilar; restrictions that are hard to explain except as survivals which have only to be pointed out to be removed; an apparent indifference in some cases to the changes that have taken place in the opportunities outside nursing and the expectations of educated women; and a very general failure to coördinate entry to the nursing profession with the later stages of school life. On the other hand, it has revealed much fruitful experiment; many hospitals ward sister who has to train successive batches of students should be given extra remuneration, and some relief from other duties, for teaching in the wards. (See para. 132.)

VI. Neither a maximum nor a minimum standard of payment to probationers is recommended in the present condition of shortage. The policy most likely to attract suitable candidates is that of offering low salaries to probationers and increasing the remuneration of the trained staff.

VII. As an experiment, certain hospitals which are known to give good training should advertise for probationers without offering any remuneration, but offering six weeks' holiday a year and two short periods of study leave (one week each) during the period of training. Scholarships could be given to ensure the supply of sufficient candidates until the scheme became well known.

VIII. The professional education of nurses should be encouraged by the provision of funds expressly allocated for the purpose—e.g., endowments and State subsidies.

SALARIES OF TRAINED NURSES IN HOSPITALS.

IX. *Staff Nurses.*—While the minimum scale of salary set out by the College of Nursing is adequate at important hospitals, considering that the post is a "learning" one, payment on this scale is unlikely to attract staff nurses to small, outlying, or special hospitals. We advise these hospitals to offer initial salaries between £65 and £80, varying with the experience and amenities provided.

X. *Ward Sisters.*—The minimum salary in hospitals not approved as training schools should be £80, rising to £120. The minimum salary for ward sisters in hospitals approved as partial training schools should be £90, rising to £150. The minimum salary for ward sisters in hospitals approved as complete training schools should be £100, rising after eight years to £160.

If the existing system is adjusted on these lines, we suggest that £10 of the ward sister's salary in approved training schools should be regarded as a fee for teaching.

XI. *Non-Resident Posts.*—The inclusive salary and emoluments offered to non-resident sisters should be of not less value than £250 a year—College of Nursing minimum scale for non-resident posts.

XII. *Higher Posts.*—We recommend the universal adoption of the College of Nursing scale of minimum salaries for posts higher than that of ward sister. This scale has already been adopted by many hospital authorities. In the higher administrative posts the responsibilities of the officer increase with the size of the hospital and the allocation of minimum salaries on the basis of the number of occupied beds is equitable.

SALARIES OF DISTRICT NURSES.

XIII. The College of Nursing minimum scale for resident district nurses (£85 to £120) should be adopted by District Nursing Associations, and if an *all-inclusive salary is offered, it should be a minimum* of £230, rising to £250 after a short term of service.

SUPERANNUATION.

XIV. All voluntary hospitals, institutions, and associations employing nurses should participate in the Federated Superannuation Scheme for Nurses and Hospital Officers.

XV. Early steps should be taken to secure the interchangeability of pension rights among employees of all Local Authorities, whether they have adopted the Act of 1922 or have a Local Act superannuation scheme, and to make provision for superannuation obligatory on Local Authorities.

XVI. Section 8 of the Local Government and Other Officers' Superannuation Act, 1922, should be extended to apply to nurses migrating between employment under *Local Authorities adopting* the Act, and employment under any institution

in the Federated Superann

and Hospital Officers, and to nurses leaving hospital to undertake private nursing.

HOURS OF DUTY.

Day Duty.

XVII. The span of work should not exceed 13 hours.

XVIII. If on one, or at most two days a week the span should be extended, it should not exceed 14½ hours, and the extra time should be compensated for by extra hours off duty.

XIX. At least 1½ hours should be allowed for meals during the span, of which 40 minutes should be allocated to midday dinner.

XX. Not less than three clear hours off duty, independent of meal times, should be allowed during the span every day.

XXI. One free day each week should be allowed.

Night Duty.

XXII. The hours of night duty should not exceed 57 in any week.

XXIII. The span of night duty should not exceed 11 hours, and should be less if possible.

XXIV. If on three nights a week at most the span should be extended to 12 hours, this should be compensated for by a shorter span on the remaining nights.

XXV. If the span is 11 hours or more, 1½ hours in all should be allowed off duty for meals and rest.

XXVI. One free night should be provided every week irrespective of three-monthly breaks.

XXVII. No nurse, except a night sister engaged as a permanent officer, should be on night duty for more than three months in any year.

CONDITIONS OF ADMISSION AND SERVICE.

Probationers.

XXVIII. The forms of application sent to candidates and the Hospital Rules supplied to probationers should be revised and modernised where necessary.

XXIX. A clause requiring long notice of withdrawal should be substituted for the threat of fines or other penalties for breach of contract.

XXX. The matron should have power to suspend, but not to dismiss, a probationer pending investigation by a committee of the Board of Management.

XXXI. A separate bedroom should be provided for each nurse; the number of bathrooms should be adequate; and the common rooms and dining-room should be airy and well appointed.

XXXII. A varied and well-cooked diet should be provided. In large institutions an expert in domestic science should be appointed to undertake the housekeeping and supervise the cooking.

XXXIII. The supervision exercised over a probationer in the Nurses' Home should be relaxed; for example, she should not have to retire to bed before 10.30 P.M., or to put out lights half an hour after retirement. The privacy of her bedroom should be respected. Permission to smoke should not be unduly restricted.

XXXIV. The Nurses' Home should be run on informal lines as a hostel under a Warden.

PANEL AND CONTRACT PRACTICE

Emergency Treatment.

WHAT is an emergency? This is a question which panel committees are always discussing when considering claims from practitioners under the emergency treatment scheme with its scale of fees. A patient suddenly falls ill, has a severe pain, or meets with an accident. He (or generally a relative) sends for his panel doctor, who may not happen to be at home. The messenger then, without saying who the patient is or even where he lives, generally flies off to another doctor who attends, gives the necessary treatment, and afterwards claims for remuneration. The insurance committee passes on the claim to the panel committee for consideration and decision. The doctor who has attended also sends a notice to the patient's own doctor, notifying him that he is claiming a fee under the emergency scheme according to the prescribed scale. The panel committee obtains statements of the case from both doctors before arriving at a decision. If the doctor who treated the patient (we may call him the emergency doctor) says the case was urgent, and his description confirms this—e.g., a hæmorrhage—the decision is a simple matter when it comes before the panel service subcommittee of the panel committee. The emergency doctor obtains his fee because the panel doctor was not available, and the money for its payment is deducted from the panel doctor's next cheque.

The first complication occurs when the emergency happens a long way from the patient's own doctor, so that no message can be sent to him, and if it were sent he would be too far away to get there in time to attend without ill-effects to the patient through waiting. Here the panel committee will order the emergency doctor to be paid according to scale, not however from the patient's own doctor's remuneration, but from the general fund, out of which all panel doctors in the area are paid. The next complication is where the emergency occurs in the area of the patient's own doctor, to whom however no message has been sent, treatment being demanded (and obtained) from a nearer doctor. Here the question of whether it is an emergency becomes important. If in the opinion of the committee the case is of such urgency—e.g., hæmorrhage from a cut, or a stroke—that the patient's own doctor could probably not have been obtained without the patient suffering harm through waiting, the emergency doctor will be paid from the general practitioner fund. But if the case was not thought to be of that degree of urgency, no claim at all will be allowed by the panel committee; the emergency doctor has then to obtain payment for his attendance from the insured person. A borderline case would be a speck of grit in the eye. Difficulty arises in this type of case where a practitioner, called by nervous relatives for something thought to be an emergency, to which he is bound under the regulations to attend, has to report to the panel committee that when he arrived there was no emergency, with the result that his claim for a fee is disallowed. He has then to claim from the insured person, often with little probability of being paid at all.

An aggrieved practitioner has the right of appeal to the Minister from the decision of the panel committee. The payment for emergency services is laid down in a scale of fees in the local distribution scheme. One item in the London area is a fee of one guinea for the treatment of a fracture. In a case which came recently before the panel committee a doctor claimed this fee for treating a fractured clavicle. There had been an accident, a pain, a lump in the region of the clavicle. The doctor examined the case, diagnosed a fracture, and treated it as such. He sent in his emergency claim for one guinea. In such cases the emergency doctor can only claim for one attendance; the patient, after the emergency has been treated, returns to his own panel doctor. In this case the patient called to see his own doctor the following day, when examination revealed subluxation of the acromio-clavicular joint without evidence of fracture. The point here that arose was that the doctor diagnosed the case as a fracture and treated it as such, and he therefore claimed a guinea fee. But X ray examination showed no fracture, and under the distribution scheme a guinea could not be paid to a case that was not a fracture, no matter what it was thought to be at the time. After discussion the panel committee decided to allow an emergency fee of 5s. for attendance at the surgery, but disallowed the fracture claim.

It should be added that there are several areas where no emergency fees are allowed. Each doctor does the emergency work that comes his way without payment, and in return has his own patients attended to in an emergency without charge.

Disciplinary Action: the Ministry of Health and the General Medical Council.

Last November a letter was sent by the General Medical Council to the Ministry of Health suggesting that it would be helpful if the Council could be officially informed of cases in which the Minister of Health had taken disciplinary action in regard to practitioners whose names appear upon the panel. A reply, dated Feb. 17th, 1932, was received from the Minister to the following effect:—

> "I am directed by the Minister of Health to say that it is understood that the convenience of the Council will, in the first instance at any rate, be met by arrangements under which they continue as at present to be informed of cases of removal from the medical list under Part VI. of the principal Regulations, and are in addition informed of (1) cases of irregular or lax certification; (2) cases of unprofessional conduct; and (3) cases in which allegations of canvassing or fraud are established or substantially supported.
>
> "The Minister will be glad to enter into arrangements on these lines, and he thinks it will be convenient that in bringing cases other than cases of removal from the medical list to the notice of the Council he should forward to them copies of the following documents: the report of the Subcommittee (normally the Medical Service Subcommittee) of the Insurance Committee by whom the matter will have been investigated in the first instance; the decision of the Insurance Committee on that report; the report of the persons who heard the appeal (if any) against the Committee's decision; the representations (if any) made by the practitioner to the Minister under Article 41 of the principal Regulations; and the Department's letter conveying the Minister's decision either to warn or censure the practitioner, or to take action with a view to the withholding of part of the remuneration otherwise payable to him. In cases of lax certification dealt with under Article 3 of the National Health Insurance (Medical Benefit) Amendment Regulations, 1930, the report of the Panel Committee will take the place of the report of the Medical Service Subcommittee."

Similar arrangements are to be made for the communication to the Council of cases arising in Wales and Scotland. At its meeting on Feb. 22nd the Executive Committee of the Council approved the procedure proposed.

which are faced with no problem because the conditions they offer attract all the nurses they require; a keen interest on the part of the leaders of the profession in the education of probationers; and above all a sense of vocation and a professional pride that have so far prevented the shortage of suitable candidates from lowering at all the standards of nursing in the country.

In our recommendations, we have endeavoured to bring together the lessons of the successful experiments that have been made and to suggest changes that will generalise the best existing practice. We have endeavoured to show how the entry to the profession can be linked up with the general system of girls' education, and to indicate measures that should go far to meet the peculiar difficulties of some of the specialised institutions. It would have been as easy as it would have been useless to take the highest standards of remuneration and conditions of other women's occupations and invite the hospital authorities to outbid them, or to recommend conditions that might attract candidates, but would be quite incompatible with the proper fulfilment of the purpose for which the nursing profession exists. It was impressed upon us by all the witnesses best qualified to speak for the profession that a sense of vocation is essential and that the standards of the profession could not be maintained merely by an economic appeal. This we fully accept, provided that it is understood that an aspirant may properly feel a call, not only to render a personal service to individual patients, but equally to take a part in health propaganda or in the important administrative and social work involved in the running of a hospital.

We have sought to eliminate anomalies, unnecessary hardships, and interferences with personal freedom. If other professions are now open to educated women, and occupations of a less exacting and responsible character offer higher or more immediately economic attractions, the inherent importance and interest of the nursing profession remain undiminished. Its status has been raised by the system of State registration and the more regular provision of education in connexion with training. Our survey has revealed no insuperable difficulties, even without revolutionary change, in the way of overcoming the shortage of suitable candidates, and we offer this Report to the authorities directly concerned and to the public, as a contribution to the solution of the problem presented by this shortage.

MEDICINE AND THE LAW.

Unsuccessful Claim against Surgeon for Negligence.

The litigation in Tudor *v.* Mein, heard before Mr. Justice McCardie and a special jury on March 2nd and 3rd, illustrates a typical risk of the profession. A surgeon operated upon a child. Four months later, when the patient is in another part of the country, a second operation is found necessary and is performed by another surgeon. The child's parents, convinced that the first surgeon must have been negligent, sue him for damages. After their case has been placed before a jury with full publicity, the defendant gives his own account of the operation and submits himself to cross-examination. He is followed in the witness-box by two other surgeons who negative the idea of negligence. Thereupon the plaintiff's counsel withdraws all allegations unreservedly, and the parents express through him their appreciation of the fact that the original operation saved their child's life. The defendant surgeon, who had been forced to defend his professional reputation against so damaging a charge, then makes an *ex gratiâ* payment in respect of the plaintiff's costs out of what the learned judge calls "a generous goodwill." The judge emphasises the fact that all allegations of negligence are entirely withdrawn and that it is recognised that the defendant is an able and experienced surgeon. Could not this result have been attained without the time and money expended over full-dress legal proceedings, not to mention the anxiety of the defendant and the interference with his work? The issue here was entirely technical; decision depended on expert opinion. Is it not possible to evolve a tribunal which would sift these claims before they reach a jury? If plaintiffs withdraw their actions on hearing what is said by the other side, could not this process take place earlier? In the action against Mr. Mein we were happily spared the spectacle of expert witnesses for the plaintiff violently attacking the reputation of a member of their own profession. It must sometimes happen that, if the expert witnesses on both sides could get together beforehand, a plaintiff might, on fuller information, discontinue proceedings.

The case against Mr. Mein may be briefly summarised. The original operation was for the removal of the appendix. The plaintiff evidently believed that nothing of the sort was done, since at the second operation the appendix was said to have been found complete. The defendant's answer was that, at the original operation, he found "everything was a mass of adhesions." He enlarged the opening and found the tip of the appendix which was gangrenous and perforated. Four and a half inches from the tip he came to where the appendix appeared to attach itself to the large intestine, and he cut it off at that point. The general practitioner and the nurse, both of whom attended the operation, were present in court and ready to say that they saw the appendix which the defendant removed. Sir Charles Gordon-Watson and Mr. Warren Low gave evidence as to the difficulty of finding the actual position of the join of the appendix and the intestine, when there are adhesions. In some cases, said Mr. Low, it was impossible; he did not suppose there was a surgeon who had *not at some* time been mistaken. This evidence virtually disposed of the claim; the surgeon who performed the second operation had previously agreed that an operator who removed 4½ inches of appendix might well think he had removed the whole.

It remains only to add that, so long as claims of this nature are a risk of practice, it is only prudent to insure against them by joining one of the experienced defence organisations. The defence on this occasion was undertaken by the London and Counties Medical Protection Society, and the defendant's membership must have proved a wise investment.

FINANCES OF THE LONDON HOSPITAL.—In 1931 the income of the London Hospital was £242,153, and the expenditure £250,030, leaving a debit balance of £8777. The expenditure, nevertheless, showed a reduction of £9517, partly due to the greater cheapness of commodities; the income was £1618 greater. The revenues from invested property was £55,241. There were 13,617 in-patients, and 81,380 new out-patients, 1200 of whom were often treated in a day. In recording that the hospital possesses 2 grammes of radium the Governors state that "undoubtedly in certain cases of cancer radium is beneficial." The Viscount Knutsford Remembrance Fund stands at £11,533.

typical reaction followed with headache, diarrhœa, nd vomiting with rise of temperature to 100° F. r 12 hours. The local reactions of the stings were evere and the swellings on face and hands remained or three days.

Dr. X regards his case as an example of sensitisation o bee-stings which persisted for ten months. After his experience his enthusiasm for bee-keeping was omewhat damped, for had he fallen insensible on the op of the hive and received the full dosage of hundreds f stings the result might have been disastrous. It would be interesting, he thinks, to find out whether ther bee-keepers have had a similar experience.

I am, Sir, yours faithfully,

A. L. GREGG.

Porchester-gardens, W., March 5th, 1932.

CHRONIC INFECTIONS OF THE LUNGS.

To the Editor of THE LANCET.

SIR,—The interesting contribution by Dr. P. J. Marett, in your last issue (p. 511) on chronic infections of the lungs by fungi and the importance of the routine mycological examination of sputum to assist in the diagnosis of these infections, whose response to treatment is by no means unfavourable, merits wide recognition. The fungi as ætiological agents in diseases of the respiratory tract have not received the attention which is their due. These pneumonomycoses (moniliasis, blastomycosis, actinomycosis, aspergillosis, &c.) may produce signs, symptoms, and even lung changes which may closely simulate pulmonary tuberculosis. Two such cases of primary monilia infection of the lung were shown by me at the Clinical Section of the Royal Society of Medicine last year. As Dr. Marett points out, the mere presence of monilia in the sputum does not indicate a primary fungous infection. These fungi are, in point of fact, not uncommonly secondary. There can be little doubt that a catarrho-pyogenic infection due to any other organism, including monilia, superimposed upon a case of pulmonary tuberculosis does tend to aggravate the tuberculous process. Treatment of this superimposed infection is often most striking, especially where this is due to a fungus upon which, as is well known, iodide of potassium has a selective action. Hence examination of the sputum in chronic lung infections should not be limited to tubercle bacilli, but should include examination for other organisms, not excluding the fungi.

I am, Sir, yours faithfully,

Harley-street, W., March 7th, 1932. PHILIP ELLMAN.

EUTHANASIA.

To the Editor of THE LANCET.

SIR,—In your kind review of my brochure on the Legalisation of Voluntary Euthanasia (THE LANCET, March 5th, p. 523) you say:—

> "Surely a movement as novel and daring as this has evoked as weighty criticism as it has approbation? If Dr. Millard has received any expressions of adverse opinion at all comparable with the favourable ones he quotes, it would probably help his cause if he were to publish them."

In reply may I say that apart from objections based on religious grounds, such as those quoted in my brochure, I have received remarkably little reasoned criticism—almost none that can be called hostile. One correspondent, whose opinion one is bound to respect, writes:—

> "You certainly make out a good case but not, I think, an unanswerable one. It seems to me that you underestimate the natural reluctance of members of the medical profession to assume the responsibility that would fall upon them; nor do I think that the possibilities of crime are eliminated. . . . I should estimate that very few doctors would pronounce any disease incurable until it was a matter only of a short time."

Of helpful criticism—if indeed it can be called criticism—the most important is from a high legal authority in London (owing to his official position he does not wish his name to appear), who has made several sympathetic and friendly suggestions as regards the legal aspect of my Bill. He doubts whether it is really necessary for applications for euthanasia to go before a court of summary jurisdiction, and he rightly points out that such a tribunal would not be the best fitted for the purpose. He thinks that it would be a sufficient safeguard if the "near relatives" had the right of appeal to such a court, which right in practice would probably be very rarely exercised. I am quite prepared to accept this suggestion. This gentleman has been at the trouble of redrafting and amending my Bill, adding the necessary legal definitions, schedule, forms of medical certificates, &c. Thanks to his legal knowledge and special experience in drafting Bills, this new Bill is undoubtedly a much better Bill than mine, and when the time comes for this question to be raised in Parliament the Bill is all ready to be put forward.

Of warm approbation I have received far more than I ever dared to hope or expect. A letter received this morning from the principal of a university college may be cited as an example: "I am intensely interested in your proposals, which I believe in completely." A distinguished member of our profession wrote me the other day: "I am in complete sympathy with your proposals, both on humanitarian and sociological grounds. . . . I wish you every success."—I am, Sir, yours faithfully,

C. KILLICK MILLARD.

Health Department, Grey Friars, Leicester, March 8th, 1932.

RELIEF OF VESICAL IRRITATION.

To the Editor of THE LANCET.

SIR,—The method described in your annotation last week (p. 524) apparently depends upon the use of mineral oil, and is described as a simple one, with claims so striking that it deserves a trial. If you will refer to your own issue of 1924, i., 179, you will find, related by myself, a technique for cystoscopy in the presence of pus and blood in which mineral oil is used as the medium. Experience has amply justified the hopes expressed when the method was first tried out. Bleeding from a papilloma in the bladder can be readily located and easily cauterised by the diathermy electrode. Mr. Canny Ryall, in his book "Operative Cystoscopy," states that in this way he has been able to deal with hæmorrhage which he could not otherwise have arrested. This is fully borne out by my experience.

Support can also be given to the statement that vesical irritation after cystoscopy and diathermy is much less than after ordinary methods. Selection of the grade of paraffin is, however, important, since liquid paraffin of the British Pharmacopœia, however useful in treatment, is too viscous for satisfactory use with the cystoscope. Oils of a low viscosity are much more suitable and easier to use.

I can most strongly recommend the method in indicated cases.—I am, Sir, yours faithfully,

W. E. M. WARDILL.

Newcastle-upon-Tyne, March 7th, 1932.

CORRESPONDENCE

TUBERCULOSIS OF CHILDHOOD.

To the Editor of THE LANCET.

SIR,—The interesting letter of Drs. Toussaint and MacIntyre raises the question of the relative value of radiography and tuberculin in the diagnosis of infantile tuberculosis. Their high opinion of the tuberculin test is rightly based on the recent report of the Medical Research Council, but their opinion of radiography is based on obsolete conclusions of a committee of the National Tuberculosis Association of America. The conclusions of this committee were made at a period when there were wide variations in radiographic technique. In the light of recent knowledge these conclusions should be revised as follows :—

> "The normal chest.—The normal chest of the child from the roentgenological standpoint is subject to no more variations than the normal hand.
>
> "Hilum shadow.—The hilum shadow in health is cast by the pulmonary artery only. Normal glands, bronchi, and veins play no part in the formation of this shadow. Glands only become visible when caseating or grossly enlarged, and are then easily identified as such.
>
> "Calcified nodes.—Calcified nodes at the root of the lung, irrespective of signs of lung disease, are definite evidence of old tuberculosis in the bronchial glands. There is no inflammatory condition except tuberculosis which causes dense calcification of the bronchial glands."

Drs. Toussaint and MacIntyre consider two of Dr. Fletcher's cases to be "incompletely resolved pneumonic conditions," and then state that "such cases are far from rare in tuberculosis dispensaries with adequate X ray facilities." In other words, there is a form of pneumonia in children which can only be diagnosed by radiography, and which is not acute inasmuch as the sufferers from it are brought to tuberculosis dispensaries. A considerable number of these "pneumonic conditions" in children have been observed in the Royal Chest Hospital, and there are certain features common to them all. The children are never acutely ill, and often have no pyrexia. The pneumonic processes observed by serial radiographs slowly resolve or calcify. What organism other than the tubercle bacillus produces a chronic and often symptomless pneumonia which can heal by calcification ?

I am, Sir, yours faithfully,
PETER KERLEY.
Weymouth-street, W., March 5th, 1932.

BLOOD TRANSFUSION IN PURPURA.

To the Editor of THE LANCET.

SIR,—In their article in your last issue (p. 509) upon Hæmorrhagic Purpura following Scarlet Fever, Dr. A. G. Gibson and Dr. F. G. Hobson state that transfusion of blood was considered in the second case, but, in view of the fact that the patient's serum agglutinated her own red cells and those of all possible donors, this procedure was, in consultation with Dr. Letheby Tidy, deemed to be impossible. May I recall two cases reported in your own columns (1931, ii., 399) by Dr. W. Stewart and myself in which transfusions of blood were given to patients in this hospital, both of whose sera agglutinated their own and all other red cells against which they were tested. Dr. S. C. Dyke demonstrated this phenomenon to be dependant upon temperature and to bear no relationship to blood group, and on his advice transfusion was performed in both cases with group-compatible blood. In both instances the transfusion was followed by a sharp reaction which was however readily controlled by adrenalin and morphia.

I am, Sir, yours faithfully,
EILEEN E. HARVEY, M.R.C.S. Eng.,
Assistant Pathologist, the Royal Hospital,
March 7th, 1932. Wolverhampton.

ANAPHYLAXIS FROM BEE-STINGS.

To the Editor of THE LANCET.

SIR,—That repeated bee-stings lead to an immunity from ill-effects is exemplified by seasoned apiarists. As yet however we have no adequate explanation for the sudden loss of this immunity which has been known to occur in even veteran bee-keepers, when without warning they have suddenly been seized with acute symptoms following a few stings which would ordinarily occasion them not a moment's notice. Simmins [1] states that the beginner at bee-keeping occasionally "is so severely punished, even by a solitary sting, that he may begin to think seriously of giving up. In a few instances the difficulty is never overcome ; but, as a rule, the apiarist becomes in time, not only used to, but quite careless of bee-stings." The actual prick however always remains painful. Herrod-Hempsall [2] mentions that "there are a few people who cannot keep bees on account of the effect of the sting upon them. In some cases the poison causes temporary distress in the form of asthma, in others a state of coma occurs, while yet again a fainting fit may result." The Roots [3] describe the occurrence of a rash of red blotches following stings, accompanied by fever ; and they cite an interesting case of a boy originally severely affected by stings who was cured of ill-effects by a course of graduated numbers of stings at intervals throughout a year.

As an example of the severe reaction which may occur, the following description by a medical friend seems to me worthy of being placed on record. Dr. X has been interested in the keeping of bees for the last two years. In August, 1930, he was "stung up" whilst, perhaps from clumsiness and inexperience, he irritated the hive to the point of frenzy. Although well protected by bee-veil and gloves, he received over 20 stings which resulted in local and systemic reactions, so that after a mild rigor he had to retire to bed with headache, diarrhœa, and general disfigurement. Subsequent to this, although conscious that the bees loved him not, he remained comparatively unmolested till June 7th, 1931. On that occasion whilst, with due preparation, he was engaged in a simple operation on his hive, he was stung on the chin and forearm by three angry bees. It was noted that the stings were particularly painful. Within ten minutes he experienced a cramping pain over the præcordial region and a curious sinking feeling radiating down the thoracic aorta. At the same time the pleasant surroundings, including the hive itself, appeared to revolve round and round in kaleidoscopic confusion. Enough consciousness remained to enable him to stagger some 40 yards from the hive when he collapsed on the garden path and there he remained unconscious for 20 minutes.

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[1] Simmins, S.: A Modern Bee Farm, 1928.

[2] Herrod-Hempsall. W.: Bee-keeping New and Old, vol. i., 1930.

[3] Root, A. I. and E. R.: A.B.C. and X.Y.Z. of Bee Culture, 1923, British Bee Jour., vol. xviii., p. 425, and vol. xxii., p. 55.

1 to ice-cream, for they did not know in all where the premises were situated in which ges were made. This was a public health ion, and what the Council wanted to do was to ct the food of the people. Therefore they ed to have the same powers with regard to ges and preserved meats, &c., as they were now g for in connexion with ice-cream. The London igh councils and the city corporation were all d that Clause 16 was necessary in order to round eir powers for preserving the health of the people. e powers were necessary to keep traders up to nark.

. **Lansbury** said he wished to join with other lon Members in saying that these clauses were ed unanimously by all the representatives of lon. Before any regulations existed in regard to matters the medical officer of health in his area continually telling him of things which he had ower to interfere with.

JUSTMENT OF PUBLIC HEALTH TO LEGITIMATE TRADING.

r E. **Hilton Young** (Minister of Health) said the ers sought for by the London County Council er this Bill were certainly not without precedent, those conferred by Clause 16, which raised so h contention. He knew of no record of any culty or friction or dissension or complaint of stice in the past. Powers that had been found ul and had given rise to no complaint in provincial s might well be useful and necessary in the ropolitan area. In this matter it was necessary adjust two very substantial interests. The first that of public health, and he could not help ig impressed by what had been said by several akers in the debate upon the big interests of public lth involved in the powers now sought by the adon County Council. On the other hand, he had n impressed by the fact that the interests of itimate trading were also involved, which the use would be concerned to safeguard. The justment of those two interests was a matter which eded very careful threshing out by a committee, her than on second reading. He had come to the nclusion that the House would be well advised t to reject the Bill at that stage, but to consider e general discussion as giving notice to the important terests involved, and to leave it to the committee adjust those interests later. The Bill contained any things in the interests of the good government London, and it would be a little out of proportion reject it as a whole when there was a possibility of ljusting matters in committee.

Mr. **Cassels**, speaking as a London Member, said at there was already ample provision in the law of le land to deal with unwholesome food. Why did le London County Council in the interests of public ealth desire to have such a full and complete inspecon of everybody's premises? Traders did not want he whole of their premises continually roamed over y inspectors under various labels. While the House ught to have the interest of public health at heart, hey ought to say that the existing law was quite ufficient, even for the London County Council.

Clause 18.

Dr. **O'Donovan** said there was an interest which had not been referred to that night—namely, the poor individuals who had the whole of Clause 18 of this Bill devoted to them. He had no objection as a London Member to any attempt to see that the food consumed by the poor should be brought up to the standard that Members would demand in their own houses, and he would be the first to say that the public health work done by the borough councils, their medical officers of health, and other officials in London was an example to the world; but in every ointment, however healing, a fly could find its place. They were instructed in this Bill that "every medical practitioner" shall, if he suspects, do certain things. It was extraordinary that the Bill did not say "every registered practitioner," and they would perhaps find herbalists, bone-setters, and faith-healers, on the strength of this wording, claiming the status of a medical practitioner. He had thoughts to which he desired to give utterance, and thoughts which he suppressed, but in this Bill every medical practitioner, and no one else, must sign his suspicion if he suspected food poisoning. He was accustomed to notifying small-pox if he believed it to be present, but that he should be compelled to notify the suspicion of disease that might cross his mind was rather too much. If he suspected food-poisoning, in the hard-hearted language of the law he must notify it by certificate forthwith.

DOCTORS AS INITIATORS IN CRIMINAL PROSECUTIONS.

If notification were for the good of the public health he would willingly notify, not on paper but by telephone, but he gathered that the London County Council was out to punish those who poisoned Londoners, and the suspicion of a doctor put upon paper might be the first instrument by which the wheels of punishment were put in motion. He asked the House to put themselves in the position of a simple honest practitioner of medicine who committed these suspicions to papers and then someone died. These matters often raised great doubt and controversy, and yet in its zeal, and proper zeal, for the guardianship of the public health, the proper authority might decide to have an investigation. What was then the position of a doctor who had committed his suspicions to paper when he was being cross-examined by the most skilful counsel that the Food Trade Association could put up to humble his suspicions to the dust?

DELAYED PAYMENT.

Furthermore there was perpetuated in this Bill an extraordinary wrong. A doctor could be assessed at two separate values. He was worth under this Bill 2*s.* 6*d.* if he was a practitioner, free and unpanelled; but if he took service under an authority and became a medical officer, or if he worked for nothing in a dispensary or a hospital, his suspicion or opinion was worth not 2*s.* 6*d.* but 1*s.* (Laughter.) He noticed that although the practitioner must notify forthwith, nevertheless there was no arrangement for payment forthwith, and it was the practice of many local bodies to accumulate these small debts, these half-crowns or shillings that were very acceptable to very young doctors starting in practice, and then to send a cheque six or nine months afterwards when the doctor had left the hospital, and the cheque became a derelict. An act which was compulsorily done forthwith should be paid for forthwith.

"EVERY PRACTITIONER ATTENDING."

It was not uncommon in difficult cases for doctors to be called in consultation, and hitherto in cases of notification there was no compulsion upon a consultant to notify. He gave his opinion to the doctor in attendance, and that was his liability; but this Bill said "every medical practitioner attending," and in drawing all the doctors in it missed the most useful source of information by its very precision of words, for often food-poisoning was not known till death, and the doctor who diagnosed food-poisoning at its deadliest and most dangerous point was not the medical practitioner in attendance, but a pathologist, and a pathologist who might let them know at the very beginning of a fatal epidemic was excluded from the Bill. He had every sympathy with the purpose of the Bill, but in this particular clause he would ask the House to remember that they were throwing upon his profession without intention a certain responsibility in criminal proceedings. They were making the medical profession initiators of criminal prosecutions on suspicion for a fee of a shilling, and there was no defence in the Bill for an honest mistake made by a man who might not be a shining light in the healing art.

PARLIAMENTARY INTELLIGENCE

NOTES ON CURRENT TOPICS.

THE WHEAT BILL.

In moving the second reading of the Wheat Bill on March 1st in the House of Commons Sir **John Gilmour** (Minister of Agriculture) said that the measure was agreed to by all the interests concerned. The Government did not contemplate that there would be a permanent increase in the price of bread as a result of this Bill, and they were satisfied that, with a maximum limit of 6,000,000 qrs., there was no danger that a permanent general increase in bread prices would result. It was, he said, only when flour and bread were cheap that the quota payment on flour was really noticeable. To-day United Kingdom consumers of flour and bread got them at lower prices than any other country in the world, except possibly Belgium.

Dr. **Salter**, who moved the rejection of the Bill, said that it was the bread consumer who was to pay the price. Bread was still the cheapest all-round food, and the poorer the family the more bread they consumed. There were, he said, hundreds of thousands of families in this country whose bread bills were over 10*s.* per week, and almost all were the very poorest people. He described the policy of the Bill as an attempt to revert to a condition of affairs in English life which had long since passed away and which could never be restored. The motion for rejection was defeated by 428 votes to 55—majority 373—and on March 2nd the Bill was read a second time and committed to a Committee of the whole House.

DANGEROUS DRUGS BILL.

On Wednesday, March 2nd, in the House of Lords, the Dangerous Drugs Bill was read the third time.

LONDON COUNTY COUNCIL BILL:

FOOD INSPECTION PROPOSALS.

In the House of Commons on Thursday, March 3rd, on the motion for the second reading of the London County Council (General Powers) Bill,

TRANSPORT OF EDIBLES

Mr. G. **Harvey** moved the rejection of the Bill. He said that two clauses in particular struck him as being unfair to the trading community of London. With regard to Clause 17, within the last day or two a concession had been made by the London County Council. It said:—

> "The London County Council is prepared to give an assurance to the following effect in the event of the opposition to this Bill being withdrawn."

That was a passage he did not like. The concession went on:—

> "Any by-laws proposed to be made by the Council in pursuance of Clause 17 shall not extend beyond the scope of Section 72 of the Public Health Act, 1925, subject to the inclusion of by-laws to deal with two additional matters, namely: (i) Arrangements to ensure cleanliness, &c., in transport: It would be understood that transport does not include [illegible] curtilage of the customer's premises. [illegible] cases in which food is wrapped in paper [illegible] wrapping shall be clean and otherwise [illegible]"

The Public Health Act, 1925, expressly excluded London, and in proposing to make by-laws in pursuance of this clause the Council met the difficulty of a good many of those who objected in the first instance. But if Section 72 of the Public Health Act, 1925, were made to apply, in his view and those who were advising him Clause 16 would not be necessary at all.

REGISTRATION OF THE SMALL TRADER.

The London County Council stated with regard to Clause 17 that some 60 provincial boroughs had adopted by-laws under the powers given to them by the Public Health Act, 1925. When the Council was asked to give a list of those 60 boroughs the number resolved itself into 17. These were written to, and only three had thought fit to utilise the power to make by-laws. Clause 16 referred to further registration requirements, and Subsection (2) was in the nature of an attempt to browbeat the small trader. The Statutory Rules and Orders, No. 1432, under the Public Health Act referring to meat set out in detail the sanitary arrangements of shops, stores, and other places in which meat was sold, or exposed for sale, and he would have thought that that ample provision would have been sufficient without further attacking traders who were trying to do their best in very difficult conditions. Under Clause 16 all meat shops had to be registered if they dealt in potted, pressed, pickled, or preserved meat, but there was no definition of those commodities in the Bill. He thought that to require a meat shop to be registered when clubs, hotels, and restaurants were exempted was quite unnecessary. The following officers had the right to inspect meat traders' premises—the meat inspector, the sanitary inspector, the medical officer of health, the shops inspector, the inspector of weights and measures, in some cases the factory inspector, the inspector from the Ministry of Labour, the inspector from the Ministry of Health, the inspector under the Food and Drugs Act, and the inspector of juveniles. Now it was proposed to add the sausage-making inspector. (Laughter.) The time was arriving when this over-inspection was becoming the bugbear of all who attempted to carry on any business.

Mr. **Herbert Williams** seconded the motion for rejection. He said none of those who opposed the Bill desired to hinder the London County Council in their splendid and beneficent work, and he appealed to the promoters to give them some reasonable undertaking with respect to Clause 16 similar to that which they had given in the matter of Clause 17.

FURTHER POWERS REQUIRED BY THE L.C.C.

Sir **Cyril Cobb** said he could give an undertaking that the by-laws which would be drawn up in due course would be drafted under Section 72 of the Public Health Act, 1925. He could not meet, however, the desire of Mr. Harvey and Mr. Williams in regard to Clause 16. The Council must have registration, and must have the necessary powers to see that such registration was effective. Clause 16 dealt with ice-cream and sausages. The Council had registered ice-cream makers since 1928, but they had not previously registered sausage-makers. At present they could do nothing against the ice-cream maker unless he refused to be registered and still went on making ice-cream; in that case they could proceed against him. They could also proceed against him if he poisoned anybody, and information of it was brought to their notice through the medical officer of health. They could not take him off the list of registered ice-cream makers, and could not refuse to register him, even though they knew from the beginning that his premises were uncleanly and insanitary. Therefore, it was necessary for them to have the further powers asked for under the Bill. At present, so far as they were able to deal with sausage-makers at all, they were obliged to fall back on the ordinary regulations of the Ministry of Health regarding food, and on the Public Health Act (London), 1891. Under that Act any medical officer of health, or sanitary inspector, might at all reasonable times enter all premises and inspect and examine any animal intended for the food of man which was exposed for sale or deposited in any place for sale or preparation for sale; also any article, whether solid or liquid, intended for the food of man, and sold, or exposed for sale, or deposited in any place for sale, or preparation for sale. At present they were in a worse position with regard to sausages than with abroad, which had been pasteurised once before tation and a second time after importation, had been n this country as pasteurised milk.—Sir E. HILTON G replied: The inquiries made by officers of my tment have afforded no evidence that any such milk een sold in this country as "pasteurised milk."

Child Adoption.

. LOVAT-FRASER asked the Minister of Health if his tion had been called to the fact that in some cases -parents who took children under the Children Act, , were paid lump sums and then disappeared, leaving hildren chargeable to the public assistance committee; whether he proposed to take legislative steps to prevent in future.—Sir E. HILTON YOUNG replied: No cases e kind described have been brought to my notice.

Vaccination Declarations.

. GROVES asked the Home Secretary whether his tion had been called to the refusal of certain London ndiary magistrates to take statutory declarations under Vaccination Act, 1907, when sitting in open court; whether he would send a communication to the London ndiary magistrates on this subject.—Sir H. SAMUEL ed: My department has received no complaints of the re indicated for some time past.

National Radium Trust.

r. JOHN asked the Minister of Health if he would furnish res of the receipts and expenditure of the National ium Trust up to Dec. 31st, 1931.—Sir E. HILTON YOUNG ied: I am informed by the National Radium Trust the total amount received by the Trust from its inception in July, 1929, to Dec. 31st, 1931, from public subscrip s, moneys voted by Parliament, and interest on porary investments, was £258,536 13*s.* 1*d.* The payments le in the same period (excluding those made by way of porary investment) were as follows:—

	£	s.	d.
chase of radium and containers	217,726	11	2
vances to Radium Commission	2,700	0	0
ting and measurement of radium	1,616	0	0
er expenses of the Trust	562	8	2
Total	£222,604	19	4

Prevention of Thames Floods.

Mr. MOREING asked the Minister of Health when it was pected that the departmental committee on Thames oods Prevention would resume its sittings; and how soon would issue its report.—Sir E. HILTON YOUNG replied: e work of this and various other committees was suspended a measure of economy. I propose to take the question resumption into consideration at an early date.

Telephone Subscribers and Deafness.

Major JESSON asked the Postmaster-General whether, aving regard to the fact that at least 20 per cent. of telephone sers suffered from deafness to a degree that prevented em from hearing the muffled sound of the double bell t present in universal use, he would consider its replacement y a single bell of more resonant quality.—Mr. GRAHAM HITE (Assistant Postmaster-General) replied: Experience ndicates that the ringing apparatus normally supplied eets the requirements of subscribers generally. Further bell of different pitch which is found to be more suitable n certain cases is supplied without charge, and an extension ell with a larger gong is provided at an additional charge hen desired.

MONDAY, MARCH 7TH.

The Indian Medical Service.

Mr. KIRKPATRICK asked the Secretary for India if he was aware that there was a feeling of uncertainty and apprehension among officers of the Indian Medical Service as to the security of their pensions; and whether the British Government guaranteed those pensions.—Sir S. HOARE replied: I am aware that there is, and has for some time been, some anxiety among officers of the Indian Services generally as to the security of their pensions, though I have not received any special representations from officers of the Indian Medical Service. The pensions of officers of the Indian Services are not guaranteed by the British Government; they are a charge on Indian revenues, and the responsibility for ensuring that the necessary funds are forthcoming rests with the Secretary of State for India. The Services subcommittee of the Indian Round Table Conference recommended that when a new constitution for India is drawn up, suitable safeguards for the payment of pensions should be provided, and the Prime Minister, in the statement made by him on behalf of His Majesty's Government, at the final meeting of the first conference, laid it down that the transfer to a responsible Government in India of responsibility for the finances of that country must necessarily be subject to such conditions as would ensure the fulfilment of the obligations incurred under the authority of the Secretary of State and the maintenance unimpaired of the financial stability and credit of India. The consent of Parliament would be required to any change in the present position, and it is inconceivable to the present Government that in dealing with any scheme of constitutional change in India, Parliament could fail to provide such safeguards as may be necessary to ensure due payment of pensions to officers who have served the country.

First-aid and Medical Aid in India.

Mr. PARKINSON asked the Secretary for India what arrangements were made by the authorities to give first-aid and medical attention to those injured by lathi charges or rifle fire.—Sir S. HOARE replied: The reports received by me show that the senior officers present are always careful to ensure that injured persons receive attention, and, when necessary, are conveyed to the nearest hospital or dispensary at the first opportunity.

Closing of Pensions Hospitals.

Mr. LOGAN asked the Minister of Pensions what Ministry hospitals had been closed in the past 12 months; and whether it was proposed to close further hospitals and make arrangements for pensioners to be treated in hospitals near their own homes on a capitation basis.—Major TRYON replied: Four hospitals—namely, Fernbank near London, Highbury Hospital, Birmingham, Blackrock Hospital, Dublin, and Kirkburton, an institution for mental cases near Huddersfield—have been closed during the past 12 months. Another institution may be closed in the current year if alternative arrangements for the treatment of patients can satisfactorily be made. The policy of the Ministry is to make use of civil hospitals as far as possible consistently with the interest of the Ministry's patients, but there are certain types of disability, as, for example, epilepsy, mental disorder, and neurasthenia, and certain types of surgical case, for which specialised arrangements or institutions are desirable in the interest of the patients.

Milk and Milk Products Commission.

Dr. CLAYTON asked the Minister of Agriculture whether he proposed to appoint a reorganisation commission for milk and milk products.—Sir JOHN GILMOUR replied: Yes, Sir.

Hypodermic Syringes for Panel Patients.

Dr. O'DONOVAN asked the Minister of Health what were the regulations governing the prescription and supply of hypodermic syringes to patients suffering from asthma under the care of practitioners on the panel and needing such syringes for self-treatment.—Sir E. HILTON YOUNG replied: The appliances in question are not included in the list of appliances contained in the Second Schedule to the Medical Benefit Consolidated Regulations, 1928, and cannot, therefore, be supplied as part of medical benefit.[1]

TUESDAY, MARCH 8TH.

Pithead Baths.

Mr. PRICE asked the Secretary for Mines the number of coal-mines furnished with pithead baths in each mining area of England, Scotland, and Wales; and the number of cases in which these had been provided out of the Miners' Welfare Fund.—Mr. ISAAC FOOT replied: The total number of coal-mines in England, Scotland, and Wales furnished with pithead baths for workmen is 103. Of these baths, 85 were provided out of the Miners' Welfare Fund, and six were partially paid for by the Fund. In addition, 41 installations, all provided out of the Fund, are in course of construction.

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[1] See THE LANCET, Feb. 20th, p. 421.

HAMPSHIRE HOSPITALS.—According to the annual report of the Royal Hampshire County Hospital there were last year 2627 in-patients, an increase of 224; 2001 of them were operated upon. They were thus distributed: men, 732; women, 1072; children, 823. There were 6220 out-patients, an increase of 184, of whom 768 were operated upon. The total average cost of each patient has fallen from £9 3*s.* 3*d.* to £8 4*s.* 8*d.*—The Royal South Hants and Southampton Hospital last year reduced the weekly cost per patient from £2 18*s.* to £2 16*s.* 4*d.* The overdraft of £59,000 has been reduced to £18,000 by the sale of securities.

DIFFICULTIES OF NOTIFICATION.

Captain FRASER said that the House ought to be sure that the provisions of this Bill were workable. There were various forms of food-poisoning. There was botulism, a very rare form, and one hardly contemplated by the provisions of the Bill. Then there were those forms of poisoning due to poisonous substances being added to food, either for the purpose of preserving the food, and which in excess became poisonous, or which were due to accident. Many cases of so-called food-poisoning arose from these causes, but they were all very slight. The inspectors or medical men would be going on an entirely blank trail if they made any inquiries about them. Then there was the commonest form of food-poisoning at which this Bill doubtless was directed, which was produced by the Gaertner bacillus. That particular bacillus existed in clean as well as in dirty surroundings. The mere removal of dirty surroundings would not remove the possibility or probability of the bacillus being present. It was present in certain kinds of meat and in rodents. It was also present in human beings. It poisoned immediately because the bacillus had put poison into the tissue of the meat, and the poison entered into the human being who had absorbed it. No inspector could find that out by mere insistance on cleanliness. Moreover, there were persons who were carriers of this particular bacillus. They became immune, but they could transmit the bacillus to any food they touched. This Bill would not do what was claimed for it. In the first place it would involve too great an expense, and the community could not afford what might have been desirable two or three years ago; secondly, there was no proof that it would be of the slightest use; and thirdly, there had not been time over a wide enough area for full criticism and complaint to have come forward. Never before had a medical man been asked to notify a disease which was so ill-defined as food-poisoning. He did not think that the mere patching up of these clauses in Committee would meet the case. On every ground Clause 18 ought to be withdrawn. The L.C.C. in the defence of their proposals told them that there were 11 deaths in three years. Yet this vast machinery was to be set up to prevent the recurrence of those cases. He would not mind expenditure to save life, but the accumulation of this kind of expenditure threatened life by making life intolerable for the people. The London County Council could get their Bill through swiftly if they would leave out the offending clauses.

MUCH UNCLEANLINESS.

Mr. LOGAN said he knew the benefits from a sanitary point of view which had been derived in Liverpool from registration under the Public Health Act. Had it ever occurred to hon. Members how much uncleanliness there could be in a great city like London in the production of ice-cream and foodstuffs? They allowed health visitors to see if houses were kept clean and not overcrowded, and yet if one bought an ice-cream in London they were not able to tell the purchaser whether it was made in a stable or in a palace. He thought that the London County Council and the sanitary authorities of London were perfectly justified from the point of view of public health in asking for these powers.

Mr. G. HARVEY said that in view of the desire of the Minister of Health that the matters raised in the debate should be thrashed out in Committee, and in view of the desire of those who objected to certain clauses of the Bill not to hamper in any way reasonable operations on the part of the L.C.C., he asked leave to withdraw his motion for rejection.

The amendment was withdrawn, and the Bill was read a second time.

VETERINARY SURGEONS BILL.

On Friday, March 4th, in the House of Commons, the Veterinary Surgeons (Irish Free State Agreement) Bill, which has already passed through the House of Lords, was read a second time.

HOUSE OF COMMONS.

WEDNESDAY, MARCH 2ND.

Health Insurance Expenditure.

Mr. BUCHANAN asked the Minister of Health the number of persons weekly receiving health insurance benefit, and if the amount was showing an increase or a decrease since the issue of leaflets and instructions to approved societies, doctors, and burgh insurance committees at the end of 1929.—Mr. ERNEST BROWN (Parliamentary Secretary to the Ministry of Health) replied: The rate of expenditure shows a decrease, and it may be inferred that there is also decrease in the numbers.

Mr. BUCHANAN asked if the hon. gentleman could state the actual decrease.

Mr. BROWN: The decrease in numbers could not be stated without examining the records of nearly 8000 approved societies. As regards the amount, the figures will be available in July when the report is published.

Sir P. HARRIS: Does this mean that there has been a general improvement in the [illegible]

Mr. BROWN: I should like to have [illegible]

Mr. BUCHANAN: Is the [illegible] circular, or are there other factors; and is not a decrease contrary to what would be expected, seeing that when unemployment is great sickness usually increases?

Mr. BROWN: The hon. Member would be unwise to draw the conclusion that the circular is the only factor to be considered.

West Middlesex Sewage Scheme.

Mr. MCENTEE asked the Minister of Health if it was at the request of the Ministry that the West Middlesex sewage scheme had been suspended; and whether, having regard to the need for this scheme and the number of persons who would be employed, he would urge the Middlesex County Council to proceed with the undertaking.—Sir E. HILTON YOUNG replied: I am informed that the West Middlesex sewage scheme has not been suspended. Nine contracts of a total value of well over 1¼ million pounds, have been entered into by the county council, six of which are in active operation. Not less than 725 men are already employed on the scheme.

THURSDAY, MARCH 3RD.

Bread Prices.

Mr. D. FOOT asked the Minister of Labour the present comparative price of the 4 lb. wheaten loaf in the following countries: Great Britain, France, Germany, Belgium, Austria, Czechoslovakia, the United States of America, Canada, Australia, Ireland, South Africa, Norway, and Sweden.—Sir H. BETTERTON (Minister of Labour) replied: The latest figures available as to the average prices of white bread in the countries named are given in the Table. In the absence of information concerning the qualities of bread to which the various quotations relate, it is not known how far the prices shown may be regarded as comparable one with another.

Country.	Date.	Average price per 4 lb. of white bread.
Great Britain and Northern Ireland (general average) ..	Feb. 1st, 1932.	7d.
France (Paris)	January, 1932.	4·09 francs.
Germany (6 large towns)	,, 1931.	1·49 reichsmarks.
Belgium (Brussels) ..	,, 1931.	3·16 francs.
Austria (Vienna) ..	Middle of January, 1932.	2·82 schillings.
Czechoslovakia (general average)	December, 1931.	4·2 korunas.
United States of America (51 towns)	Dec. 15th, 1931.	28·8 cents.
Canada (69 towns) ..	Beginning of December, 1931.	24 cents.
Australia (6 large towns)	Sept. 15th, 1931.	7·2d. to 10·9d.
Irish Free State (general average).	Middle of November, 1931.	8d.
Union of South Africa (9 towns)	December, 1931.	14·72d.
Norway (general average)	November, 1931.	1·25 kroner.
Sweden (49 towns) ..	January, 1932.	1·35 kroner.

Note.—The figures given are taken from official publications of the countries concerned, except in the case of Germany and Belgium, for which countries they are extracted from the "International Labour Review," published by the International Labour Office, which is the only available source of information as to the price of white bread in those countries.

Imported Milk and Public Health.

Mr. KIMBALL asked the Minister of Health whether any action had been taken to discover if fresh milk imported abroad, which had been pasteurised once before ation and a second time after importation, had been n this country as pasteurised milk.—Sir E. HILTON G replied: The inquiries made by officers of my tment have afforded no evidence that any such milk een sold in this country as "pasteurised milk."

Child Adoption.

. LOVAT-FRASER asked the Minister of Health if his tion had been called to the fact that in some cases -parents who took children under the Children Act, were paid lump sums and then disappeared, leaving hildren chargeable to the public assistance committee; whether he proposed to take legislative steps to prevent in future.—Sir E. HILTON YOUNG replied: No cases e kind described have been brought to my notice.

Vaccination Declarations.

. GROVES asked the Home Secretary whether his tion had been called to the refusal of certain London ndiary magistrates to take statutory declarations under Vaccination Act, 1907, when sitting in open court; whether he would send a communication to the London ndiary magistrates on this subject.—Sir H. SAMUEL ed: My department has received no complaints of the re indicated for some time past.

National Radium Trust.

r. JOHN asked the Minister of Health if he would furnish es of the receipts and expenditure of the National ium Trust up to Dec. 31st, 1931.—Sir E. HILTON YOUNG ied: I am informed by the National Radium Trust the total amount received by the Trust from its incep- in July, 1929, to Dec. 31st, 1931, from public subscrip- s, moneys voted by Parliament, and interest on porary investments, was £258,536 13*s.* 1*d.* The payments le in the same period (excluding those made by way of porary investment) were as follows:—

	£	*s.*	*d.*
chase of radium and containers	217,726	11	2
vances to Radium Commission	2,700	0	0
ting and measurement of radium	1,616	0	0
ler expenses of the Trust	562	8	2
Total	£222,604	19	4

Prevention of Thames Floods.

Mr. MOREING asked the Minister of Health when it was pected that the departmental committee on Thames oods Prevention would resume its sittings; and how soon would issue its report.—Sir E. HILTON YOUNG replied: le work of this and various other committees was suspended a measure of economy. I propose to take the question resumption into consideration at an early date.

Telephone Subscribers and Deafness.

Major JESSON asked the Postmaster-General whether aving regard to the fact that at least 20 per cent. of telephone sers suffered from deafness to a degree that prevented hem from hearing the muffled sound of the double bell t present in universal use, he would consider its replacement y a single bell of more resonant quality.—Mr. GRAHAM VHITE (Assistant Postmaster-General) replied: Experience ndicates that the ringing apparatus normally supplied eets the requirements of subscribers generally. Further bell of different pitch which is found to be more suitable n certain cases is supplied without charge, and an extension ell with a larger gong is provided at an additional charge when desired.

MONDAY, MARCH 7TH.

The Indian Medical Service.

Mr. KIRKPATRICK asked the Secretary for India if he was aware that there was a feeling of uncertainty and apprehension among officers of the Indian Medical Service as to the security of their pensions; and whether the British Government guaranteed those pensions.—Sir S. HOARE replied: I am aware that there is, and has for some time been, some anxiety among officers of the Indian Services generally as to the security of their pensions, though I have not received any special representations from officers of the Indian Medical Service. The pensions of officers of the Indian Services are not guaranteed by the British Government: they are a charge on Indian revenues, and the responsibility for ensuring that the necessary funds are forthcoming rests with the Secretary of State for India. The Services subcommittee of the Indian Round Table Conference recommended that when a new constitution for India is drawn up, suitable safeguards for the payment of pensions should be provided, and the Prime Minister, in the statement made by him on behalf of His Majesty's Government, at the final meeting of the first conference, laid it down that the transfer to a responsible Government in India of responsibility for the finances of that country must necessarily be subject to such conditions as would ensure the fulfilment of the obligations incurred under the authority of the Secretary of State and the maintenance unimpaired of the financial stability and credit of India. The consent of Parliament would be required to any change in the present position, and it is inconceivable to the present Government that in dealing with any scheme of constitutional change in India, Parliament could fail to provide such safeguards as may be necessary to ensure due payment of pensions to officers who have served the country.

First-aid and Medical Aid in India.

Mr. PARKINSON asked the Secretary for India what arrangements were made by the authorities to give first-aid and medical attention to those injured by lathi charges or rifle fire.—Sir S. HOARE replied: The reports received by me show that the senior officers present are always careful to ensure that injured persons receive attention, and, when necessary, are conveyed to the nearest hospital or dispensary at the first opportunity.

Closing of Pensions Hospitals.

Mr. LOGAN asked the Minister of Pensions what Ministry hospitals had been closed in the past 12 months; and whether it was proposed to close further hospitals and make arrangements for pensioners to be treated in hospitals near their own homes on a capitation basis.—Major TRYON replied: Four hospitals—namely, Fernbank near London, Highbury Hospital, Birmingham, Blackrock Hospital, Dublin, and Kirkburton, an institution for mental cases near Huddersfield—have been closed during the past 12 months. Another institution may be closed in the current year if alternative arrangements for the treatment of patients can satisfactorily be made. The policy of the Ministry is to make use of civil hospitals as far as possible consistently with the interest of the Ministry's patients, but there are certain types of disability, as, for example, epilepsy, mental disorder, and neurasthenia, and certain types of surgical case, for which specialised arrangements or institutions are desirable in the interest of the patients.

Milk and Milk Products Commission.

Dr. CLAYTON asked the Minister of Agriculture whether he proposed to appoint a reorganisation commission for milk and milk products.—Sir JOHN GILMOUR replied: Yes, Sir.

Hypodermic Syringes for Panel Patients.

Dr. O'DONOVAN asked the Minister of Health what were the regulations governing the prescription and supply of hypodermic syringes to patients suffering from asthma under the care of practitioners on the panel and needing such syringes for self-treatment.—Sir E. HILTON YOUNG replied: The appliances in question are not included in the list of appliances contained in the Second Schedule to the Medical Benefit Consolidated Regulations, 1928, and cannot, therefore, be supplied as part of medical benefit.[1]

TUESDAY, MARCH 8TH.

Pithead Baths.

Mr. PRICE asked the Secretary for Mines the number of coal-mines furnished with pithead baths in each mining area of England, Scotland, and Wales; and the number of cases in which these had been provided out of the Miners' Welfare Fund.—Mr. ISAAC FOOT replied: The total number of coal-mines in England, Scotland, and Wales furnished with pithead baths for workmen is 103. Of these baths, 85 were provided out of the Miners' Welfare Fund, and six were partially paid for by the Fund. In addition, 41 installations, all provided out of the Fund, are in course of construction.

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[1] See THE LANCET, Feb. 20th, p. 421.

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HOUSE OF COMMONS.

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Imported Milk and Public Health.

Mr. **KIMBALL** asked the Minister of Health whether any action had been taken to discover if fresh milk imported

SCOTLAND.

(FROM OUR OWN CORRESPONDENT.)

ULMONARY TUBERCULOSIS: AN END-RESULT.

his annual report Dr. William Munro, superin- nt of Glenlomond Sanatorium, makes a very atic statement on the "lateness" of pulmonary culosis. For several years he has been making vations on this problem, which is undergoing ssion everywhere. He states that pulmonary culosis is an end-result, a late visceral manifesta- of a previous infection.

ome medical observers seem to have difficulty in ting this truth. London observers do not appear to l pulmonary tuberculosis as a late manifestation of a ood infection. They are wrong and far wrong. acts are all against them. They point out that in ing the histories of their adult pulmonary cases, they been struck with the fact that few of them ever had nent for any tuberculosis condition in earlier years. cannot have searched the histories very well. They systematic disturbance of a primary infection."

Munro states that he has pleaded for an nination of school-children to determine the ber of reactors, and at leaving that knowledge ld be priceless. From the knowledge supplied routine test one could be on guard every time. her spreads of tuberculosis could be correctly aised and steps taken towards complete arrest he disease in the earliest manifestations. Need- to say, this view is not universally accepted. this time, the data for a final decision should be cient.

DIPHTHERIA IMMUNISATION.

n the London County Council report on diphtheria. nburgh, Aberdeen, Dundee, and Glasgow get credit for their pioneer work in this field. erdeen and Edinburgh stand easily first. It is icult to understand why either Scotland or England been so slow to develop the Schick test and oid immunisation as well as scarlet fever immunisa- n. But the amount actually accomplished in otland has, on the whole, been very satisfactory. Aberdeen, Dundee, and Edinburgh the parents ame enthusiastic.

MEDICAL NEWS

iversity of London.

The University Court has accepted a gift of £88,000 m the Rockefeller Foundation towards the endowment the department of zoology and comparative anatomy University College. The gift was conditional, inter alia, the University providing £30,000 for land, buildings, d equipment, and this condition has now been met.

The Senate has approved in principle the institution of Academic Diploma in Radiology, and syllabuses therefore ll be issued in due course.

Sir Ernest Graham-Little, M.P., has been appointed a ember of the court of governors of the London School of giene and Tropical Medicine, and Sir William Collins ll represent the University at the tercentenary celebrations the University of Amsterdam next June.

The Senate will shortly consider applications for grants rom the Dixon Fund for assisting scientific investigations, nd for the Thomas Smythe Hughes and Beaverbrook dical Research Funds for assisting original medical search. Applications must be received in proper form not later than May 15th. Application is also invited for the Laura de Saliceto Studentship for the advancement of Cancer Research, which is of the value of £150 a year. Candidates may be of either sex and need not be members of the University. Further particulars may be had from the Academic Registrar.

International Society of Orthopædic Surgery.

The second congress of this society will be held in London at the house of the Royal Society of Medicine from July 19th to 22nd, 1933, under the presidency of Prof. Nové-Josserand, of Lyon.

Territorial Army Medical Officers' Association.

A general meeting of this association will be held at 37, Russell-square, London, W.C., on Thursday, March 17th, at 3 P.M., at which all Territorial Army medical officers (active and retired) are invited to be present.

Lectures on Tropical Hygiene.

The British Red Cross Society will hold a course of seven lectures and demonstrations on tropical hygiene at 5.30 P.M. on Mondays, Wednesdays, and Fridays, from April 4th, at 9, Chesham-street, London, S.W.

Royal Medical Benevolent Fund.

The ninety-sixth annual general meeting of this Fund will be held in the rooms of the Medical Society of London, 11, Chandos-street, W., at 5 P.M., on Tuesday, March 15th.

Radium Institute, London.

Lord Moynihan, of Leeds, has been elected a member of the committee of this Institute in the place of Sir Hugh Rigby, who has resigned.

Sheffield Hospitals' Contributory Fund.

Last year this fund collected £103,861, a decrease of £7585; but 32,000 contributors have promised to increase their weekly payments from 1d. to 2d. in the pound, which will add £9500 to the annual income.

Nottingham General Hospital.

Mr. R. G. Hogarth, senior surgeon of Nottingham General Hospital, recently reopened the old main theatre of the institution which has been reconditioned at a cost of £4000, given by Sir Thomas Shipstone. It will in future be known as the Shipstone theatre.

Enlargement of Weymouth Hospital.

The Earl of Shaftesbury, Lord-Lieutenant of Dorset, has opened an extension of Weymouth and District Hospital which has cost £15,000. The additions comprise a large waiting-room, a new dispensary, a casualty room adjoining the main entrance, a new theatre, four doctors' consulting rooms, a dental surgery, ear, nose, and throat, electrical and massage departments, and an extension of the X ray room.

Society of Public Analysts.

The fifty-sixth anniversary dinner was held on March 4th at the Trocadero, when the chair was taken by the retiring President, Mr. J. T. Dunn, public analyst for Newcastle-on-Tyne. The President-elect, Mr. F. W. F. Arnaud, occupied the vice-chair. Among the guests were Lord Atkin, who proposed the toast of the Society; the Lord Mayor of Newcastle, the President of the Royal Society, Sir Ernley Blackwell, and Sir Ernest Graham-Little. In replying to the toast of the Civil Service, Sir E. Blackwell referred to the appointment of two early members of the Society, Sir Thomas Stevenson and Dr. C. Meymott Tidy, as the first Home Office analysts, and remarked that the findings of fact by the official analyst were invariably accepted by the other side in court, although alternative explanations were frequently offered. Lord Atkin referred to his experiences of the working of the Food and Drugs Act as a member of a county bench in Wales. He stressed the importance of adequate standards, not only for milk, but for any other foods to which they might be applicable. He quoted Tennyson's lines (from Maud) written at a time (1855) when public opinion on the adulteration of foods and drugs was becoming ripe for legislation—

"... chalk and alum and plaster are sold to the poor for bread,
And the spirit of murder works in the very means of life."

and

"... another is cheating the sick of a few last gasps, as he sits
To pestle a poisoned poison behind his crimson lights."

Sir Gowland Hopkins, in responding for the Kindred Societies (proposed by Mr. A. Chaston Chapman, F.R.S., a past President) which were also represented by Prof. G. T. Morgan (President of the Society of Chemical Industry), Mr. Percy Gates (President of the Institute of Brewing), Mr. George Gray (Vice-President of the Institute of Chemical Engineers), by the Registrar, Mr. R. B. Pilcher, and many Fellows of the Institute of Chemistry, referred to his early days as an articled pupil of a public analyst.

OBITUARY

ARTHUR BOULTON, M.R.C.S. Eng., D.P.H.

Dr. Boulton, who died on Feb. 15th at the age of 65, was the son of the late Dr. A. E. Boulton, of Horncastle. Educated at Epsom College, he studied medicine at Charing Cross Hospital, and took the conjoint diploma in 1890. A few years later he obtained the D.P.H., having in the meantime acted as surgeon to the Cornelia Hospital at Poole, surgeon to the Clan Line, while for a time he was assistant visiting surgeon to the Albany General Hospital, Grahamstown, S. Africa. On returning to England he became M.O.H. to the Horncastle rural and urban district councils and to the Woodhall Spa urban district council. He was inspector for epileptic and mentally defective children to the Lindsay Educational Committee, medical superintendent of the isolation hospital, medical officer to the Horncastle Dispensary, and medical referee to several insurance companies. In his early days Dr. Boulton had been a keen sportsman and a good footballer, while he was an accomplished amateur actor.

BOSTON ELPHINSTONE FORDYCE, M.B. Edin.

Dr. Fordyce, who died at a nursing home in Cambridge on Feb. 19th at the age of 74, was a well-known medical man in the city, having been in practice there for more than 40 years. Born at Duns, Berwickshire, in 1858, he graduated in medicine and surgery at Edinburgh in 1883. Early in his professional life he came to Cambridge, and soon acquired a considerable practice. He was an active member of the British Medical Association, on which body he represented East Anglia, while he also interested himself in public affairs, and became a member of the Cambridge county council in 1895. He was made an alderman in 1913, the year before he resigned from the council, and during the 19 years of his municipal service he did useful work on public health and education committees. In 1922 he became a member of the Cambridge town council, representing West Chesterton ward till 1926, and interested himself in public health and maternity and child-welfare work. He married Mabel, youngest daughter of the late Dr. William Moxon, of Northampton, and leaves two daughters and one son.

Dr. Robert Emmerson Brown, who died at Willington, Co. Durham, at the age of 67, was a popular practitioner and a prominent Freemason. He retired from practice last year. Qualifying with the Scottish triple qualification in 1890, Dr. Brown set up in practice at Willington, and met with professional success at once. He was appointed medical officer of health to the urban council, and held the post for 40 years; also a similar office for the western district of the Durham union for 30 years. His other public appointments included those of colliery surgeon for the Brancepeth group of collieries, police surgeon, and railway surgeon. He leaves a widow and a son, Dr. R. A. Brown, who has assisted his father for some years.

Dr. Oliver Barber, whose death took place on Feb. 14th at St. Leonards, Sussex, was in practice for more than half a century there and in Sheffield. He was born in Yorkshire, and qualified in 1872 with the usual diploma, and after holding a resident post at the South Staffordshire Hospital, Wolverhampton, became resident surgeon at the Sheffield Royal Infirmary, and demonstrator of anatomy at the School of Medicine, now a department of the University of Sheffield. On retiring from this post he graduated M.D. at St. Andrews in 1892 and joined his brother in Sheffield in private practice, but a severe illness in 1896 caused him to seek the climate of Hastings, where he remained until his death, and in active practice until 1919. During the war he was examiner for recruits for the Hastings district, a duty which he discharged with efficiency.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE.

The following appointments have been notified: Surg. Comdr. J. D. Bangay to *Victory*, for R.N. Barracks.

Surg. Lts. W. D. M. Sim to *Pembroke*, for R.N. Barracks and W. V. Beach to *Delhi* and to *Dragon*.

ROYAL NAVAL VOLUNTEER RESERVE.

Surg. Sub-Lt. A. C. Howard to be Surg. Lt.

ROYAL ARMY MEDICAL CORPS.

The notification of the relinquishment of the prov. rank of Capt. by Lt. (prov. Capt.) J. W. Kendall, half-pay list, is cancelled.

Lt. (on prob.) R. C. Langford is restd. to the estab.

Lt. W. D. Hughes to be Capt.

The undermentioned to be Lts.: C. S. Gross and D. P. F. Mulvany, from temp. commns.

T. J. Moloney is granted a temp. commn. in the rank of Lt.

TERRITORIAL ARMY.

Col. Sir W. R. Smith vacates the appt. of Hon. Col. R.A.M.C., Units, 44th (Home Counties) Div. T.A., on completion of tenure.

Col. C. P. Oliver (late R.A.M.C., T.A.) to be Hon. Col. R.A.M.C., Units, 44th (Home Counties) Div. T.A.

Col. J. Clay vacates the appt. of Hon. Col. R.A.M.C., Units, 50th (Northumbrian) Div., T.A., on completion of tenure.

Col. J. M. Gover to be Hon. Col. R.A.M.C., Units, 50th (Northumbrian) Div., T.A.

DEATHS IN THE SERVICES.

Lt.-Col. James Henry Reynolds, A.D.M.S. (retd.), V.C., who died at the age of 88 on March 4th, was the son of Mr. L. Reynolds, J.P., of Co. Longford, and was born at Kingstown in 1844. He graduated in medicine and surgery at Trinity College, Dublin, in 1867, and received his first commission in the Army in the following year. In 1875 he accompanied the expedition to Griqualand, and afterwards distinguished himself in the South African operations of 1877–79, serving in the Kaffir campaign and the Zulu campaign, and being present at the Defence of Rorke's Drift and at the battle of Ulundi. It was at Rorke's Drift that he won the V.C., the official record being "for the conspicuous bravery during the attack at Rorke's Drift on Jan. 22nd and 23rd, 1879, which he exhibited in his constant attention to the wounded under fire, and in his voluntarily conveying ammunition from the store to the defenders of the hospital, whereby he exposed himself to a crossfire from the enemy both in going and returning." Mentioned in despatches, he also received the medal with clasp, and was specially promoted Surg.-Major. He was awarded the Gold Medal of the British Medical Association, elected an honorary Fellow of the Royal College of Physicians of Ireland, and made an honorary LL.D. of Dublin. Lt.-Col. Reynolds married in 1880 Elizabeth, daughter of Dr. McCormick. He retired in 1896.

It will be recalled that Lt.-Col. Reynolds was one of the seniors among the distinguished company who attended the dinner to V.C.'s, over which the Prince of Wales presided at the House of Lords in 1929.

Lewes Hospital Penny Fund.—In the eight years of its working £6950 has been raised by this Fund; £6491 has been paid to the Lewes Victoria Hospital and £353 to other institutions. The total cost of administration in the eight years has been only £106.

2 P.M. to 4 P.M., Operations, Medical, Surgical, and Throat, Nose and Ear Out-patients.

URDAY.—9 A.M. to 1 P.M., Throat Operations, Medical Ward Visit. Children's Medical Out-patients. Surgical Out-patients.

I-WEST LONDON POST-GRADUATE ASSOCIA-, St. James' Hospital, Ouseley-road, Balham.

TESDAY, March 17th.—4 P.M., Dr. Hector C. Cameron: Demonstration of Children's Ailments.

NAL HOSPITAL, Queen-square, W.C.

NDAY, March 14th.—2 P.M., Dr. Riddoch: Out-patient Clinic. 3.30 P.M., Dr. Hinds Howell: Trauma in Relation to Nervous Disorders.

ESDAY.—2 P.M., Dr. Walshe: Out-patient Clinic. 3.30 P.M., Dr. Adie: Neurosyphilis.

EDNESDAY.—2 P.M., Dr. Martin: Out-patient Clinic.

URSDAY.—2 P.M., Dr. Kinnier Wilson: Out-patient Clinic. 3.30 P.M., Mr. Just: Intracranial Complications of Otitis Media.

IDAY.—2 P.M., Dr. Adie: Out-patient Clinic. 3.30 P.M., Dr. James Collier: Remarks upon *Polyneuritis*.

ING CROSS HOSPITAL MEDICAL SCHOOL.

NDAY, March 13th.—10.45 A.M., Dr. C. K. H. Hamilton: The Premature Infant. 11.45 A.M., Mr. A. C. MacLeod: Radium Therapy from the Clinical Aspect.

S COLLEGE HOSPITAL MEDICAL SCHOOL, mark-hill, S.E.

HURSDAY, March 17th.—9 P.M., Mr. W. I. Daggett: Ear, Nose, and Throat Operations of General Practice.

L NORTHERN HOSPITAL, Holloway-road, N.

EDNESDAY, March 16th.—3.15 P.M. (at the Royal Chest Hospital), Dr. P. Kerley: Radiological Examination of Cardiac Cases.

ARK'S HOSPITAL, City-road, E.C.

HURSDAY, March 17th.—4.30 P.M., Mr. W. B. Gabriel: The Elucidation of Rectal Symptoms; Pain.

RAL LONDON THROAT, NOSE, AND EAR HOS-AL, Gray's Inn-road, W.C.

RIDAY, March 18th.—4 P.M., Mr. J. D. McLaggan: Giddiness.

PSTEAD GENERAL AND NORTH-WEST LONDON SPITAL.

VEDNESDAY, March 16th.—4 P.M., Dr. H. C. Semon: Diseases of the Buccal Mucosa.

DON SCHOOL OF DERMATOLOGY, St. John's Hospital, Leicester-square, W.C.

UESDAY, March 15th.—5 P.M., Dr. H. MacCormac: Malignant Growths of the Skin.

THURSDAY.—5 P.M., Dr. I. Muende: Pathology Demonstration.

IONAL COUNCIL FOR MENTAL HYGIENE.

WEDNESDAY, March 16th.—5.30 P.M. (at 11, Chandos-street, W.), Mr. Gerald Heard: Penal Methods of the Future.

OATS HOSPITAL, Manchester.

THURSDAY, March 17th.—4.15 P.M., Miss M. Hilton Royle: The Influence of Body Mechanics on Health. (With Demonstration of Exercises.)

MARY'S HOSPITALS, Manchester.

FRIDAY, March 18th.—4.15 P.M. (at the Whitworth-street West Hospital), Mr. Arnold Jones: Allergic Affections of the Nose and Throat.

CHESTER ROYAL INFIRMARY.

TUESDAY, March 15th.—4.15 P.M., Dr. C. H. Melland: Some Cases of Cardiac Irregularity.

FRIDAY.—4.15 P.M. Dr. A. H. Holmes: Demonstration of Medical Cases.

FORD ROYAL HOSPITAL.

THURSDAY, March 17th.—Mr. G. Jefferson: Demonstration of Surgical Cases.

THALMIC INSTITUTION, Glasgow.

WEDNESDAY, March 16th.—4.15 P.M., Dr. Alex. Garrow: Eye Cases.

Vacancies

or further information refer to the advertisement columns.

renny, Monmouthshire Mental Hospital.—Jun. Asst. M.O. £350.

d, Heatherwood Hospital for Orthopædic Children.—Res. Med. Supt. £850.

bury, Royal Buckinghamshire Hospital.—Res. M.O. £200.

staple, North Devon Infirmary.—Res. M.O. At rate of £150.

h, Royal Mineral Water Hospital.—Physician.

t Memorial Fellowships for Medical Research.—Jun. Fellows. Each £400.

mingham City Mental Hospital.—Med. Supt. £625.

kburn County Borough.—Res. Asst. M.O. and Jun. Asst. M.O. £350 and £150 respectively.

on Infirmary and Dispensary.—H.P. £150.

dford, Royal Eye and Ear Hospital.—Jun. H.S. £150.

tol Eye Dispensary.—Hon. Ophthalmic Surg.

tol Eye Hospital.—Asst. Res. H.S. £100.

tol Royal Infirmary.—H.S. to Jun. Hon. S. At rate of £60.

diff City.—Asst. M.O. £500.

diff, Welsh National School of Medicine.—Jun. Asst. in Medical Unit. £250.

sle, Cumberland Infirmary.—H.S. to Spec. Dept. At rate of £155.

lmsford, Essex C.C.—Consultant Surgeon. £200.

ester, East Lanchashire Tuberculosis Colony, Barrowmore Hall, Gt. Barrow.—H.P. At rate of £100.

lsden and Purley U.D.C.—Temporary M.O.H. At rate of £800.

entry and Warwickshire Hospital.—Res. H.P. and H.S. £160 and £125 respectively.

Doncaster Royal Infirmary.—Sen. Cas. H.S. At rate of £175

Dublin, Board of Assistance.—Radiologist. £300.

Edinburgh Royal Hospital for Mental and Nervous Disorders.—Asst. Physician. £300.

Evelina Hospital for Children, Southwark, S.E.—H.S. At rate of £120.

Gloucester, Gloucestershire Royal Infirmary, &c.—Surgeon

Guildford, Royal Surrey County Hospital.—H.S. £150.

Hampstead General and N.W. London Hospital, Haverstock Hill, N.W.—Cas. Surg. O. for Out-patient Dept. At rate of £100.

Harrogate Infirmary.—Sen. H.S. At rate of £150.

Hereford, [illegible] Hospital.—H.P. £150.

Hospital [illegible] seases of the Chest, Brompton, S.W. [illegible] Worker. £350. Also Med. Reg. £200.

Hospital for Sick Children, Great Ormond-street, W.C.—H.P. and H.S. Each at rate of £100.

Ilford, King George Hospital.—Cas. H.S. At rate of £100.

Ipswich, East Suffolk and Ipswich Hospital.—H.S. and H.P. Each £120.

Isleworth, West Middlesex County Hospital.—Res. Asst. M.O. £400.

Lancaster County Mental Hospital.—Asst. M.O. £500.

Liverpool City.—Pathologist. £700.

Liverpool, County Mental Hospital, Rainhill.—Asst. M.O. £500.

Liverpool and District Hospital for Diseases of the Heart.—H.P. At rate of £100.

Liverpool, Stanley Hospital.—Gynæcological H.S. At rate of £100.

London Lock Hospital, 91, Dean-street, W.—H.S. for Male Lock Hospital. At rate of £175.

Macclesfield General Infirmary.—Sen. and Second H.S.'s. At rate of £180 and £150 respectively.

Manchester Royal Infirmary, Central Branch, Roby-street.—H.S. At rate of £100.

Manchester and Salford Hospital for Skin Diseases.—Asst. M.O. £100.

Margate, Royal Sea Bathing Hospital.—Asst. Med. Supt. £500.

Middlesbrough, Holgate Municipal Hospital.—Jun. Res. M.O. At rate of £160.

Miller General Hospital, Greenwich-road, S.E.—Hon. Orthopædic Surgeon.

Northampton General Hospital.—H.P. and three H.S.'s. Each at rate of £150.

Norwich, Norfolk and Norwich Hospital.—H.P. £120.

Nottingham and Midland Eye Infirmary.—Res. H.S. £200.

Parbold, Lancs, Wrightington Hospital.—Jun. Asst. M.O. £200.

[illegible]—Hon. Radiologist.

[illegible] *Earl's-court, S.W.*—[illegible], Physician to Out- [illegible] £100.

[illegible] *S.W.*—Res. M.O. At rate of £150.

Queen's Hospital for Children, Hackney-road, E.—Surgeon to Ear, Nose, and Throat Dept.

Reading University, National Institute for Research in Dairying. Director.

Royal Waterloo Hospital for Children and Women, Waterloo-road, S.E.—Hon. Ophth. S., Cas. O. £200. Also H.S. At rate of £100.

St. Alfege's Hospital, 48, Vanbrugh Hill, Greenwich, S.E.—Res. Asst. M.O. £350.

St. Helens County Borough.—Deputy M.O.H. £700.

St. Leonards-on-Sea, Buchanan Hospital.—Jun. H.S. At rate of £125.

St. Thomas's Hospital.—Ophth. Reg. and Refractionist. £200.

Salford, Hope Hospital, Pendleton.—Asst. Res. M.O. At rate of £250.

Salford Royal Hospital.—Hon. Physician.

Samaritan Free Hospital for Women, Marylebone-road, N.W.—Anæsthetist.

Scarborough Hospital and Dispensary.—Two H.S.'s. Each at rate of £175.

South London Hospital for Women, Clapham Common, S.W.—H.P. and two H.S.'s. Each at rate of £100.

Southampton, Royal South Hants and Southampton Hospital.—Hon. Asst. Surg.

Southend-on-Sea, New General Hospital.—Hon. Surgeon, Physicians, &c. Pathologist £500. Radiologist £500, and Pharmacist £350.

Stafford, Staffordshire General Infirmary.—H.P. At rate of £150.

Stoke-on- [illegible] *ry.*—H.S. £150.

Taunton, [illegible] House M.O. and H.S.

Victoria [illegible] *Chelsea, S.W.*—Dental Surgeon.

Wakefield Clayton Hospital.—Two Jun. H.S.'s. Each at rate of £150.

West London Hospital, Hammersmith-road, W.—H.P. and H.S.'s., H.S. to Ear, Nose, and Throat Dept., and Res. Anæsthetist. Each at rate of £100. Also Hon. Med. Radiologist.

Wigan, Royal Albert Edward Infirmary and Dispensary.—H.S. At rate of £150.

Willesden General Hospital, N.W.—Cas. O. At rate of £120. Also H.S. and H.P. At rate of £110 and £100 respectively.

The Chief Inspector of Factories announces vacant appointments for Certifying Factory Surgeons at Esher (Surrey), and Leamington (Warwick).

CORRECTION.—In the report last week (p. 514) of the Section of Comparative Medicine at the Royal Society of Medicine the remarks on milk fever and eclampsia attributed to Prof. F. J. Browne were made by Mr. R. H. Paramore.

King Edward's Hospital Fund for London.

Hospitals within 11 miles of St. Paul's desiring to participate in the grants made by King Edward's Hospital Fund for London for the year 1932 must make application before March 31st to the hon. secretaries of the Fund at 7, Walbrook, E.C. 4. Applications will also be considered from convalescent homes which are situated within the above area or which take a large proportion of patients from London.

Victor Horsley Memorial Lecture.

The Victor Horsley Memorial Fund was raised in 1920 to commemorate the services of Sir Victor Horsley to science and the Empire, and is devoted to the giving of a lecture triennially in London entitled the Victor Horsley Memorial Lecture. The fourth lecture is due to be delivered in 1932, and the trustees (who consist of the Presidents of the Royal Society, the Royal College of Surgeons of England, and the British Medical Association, the senior physician of the National Hospital for the Paralysed and Epileptic, Queen-square, the senior surgeon of University College Hospital, and Mr. Stanley G. Robinson, the son-in-law of Sir Victor Horsley) have invited Prof. E. D. Adrian, F.R.S., F.R.C.P., of Cambridge, to give the lecture. This he has consented to do, and the lecture will be delivered on July 20th next, under the title of Visceral Sense Organs. It is hoped that Sir Frederick Gowland Hopkins, F.R.C.P. (President of the Royal Society), will take the chair, and further details will be published later.

Contributory Patients and Medical Staffs.

Last year the Pembrokeshire County War Memorial Hospital admitted the record number of 862 in-patients, and the annual report expresses the hope that "at some future time, when money permits," it may be further extended. The report of the medical staff contends that this time has come, since the hospital is "in a happy and unusual financial position," and calls attention to "the total inadequacy of accommodation and resulting overcrowding of patients in the wards," which results almost entirely from emergency admissions. The present situation is "totally unacceptable to the visiting staff." Last year's income was increased from just over £7000 to just under £8000, mainly on account of the "extraordinary measure of popularity" of the contributory scheme. The medical staff think that there should be more efficient control over the eligibility for treatment of patients under that scheme. They suggest the appointment of a reception committee "with a due representation of the medical staff." The medical fund received £958, at the rate of £2 3s. 3d. for every contributory patient.

Medical Diary

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.
MONDAY, March 14th.—4.30 P.M., UNITED SERVICES. Paper: Squadron-Leader T. C. St. C. Morton: The [illegible] of Heat Exhaustion and
TUES [illegible] MEETING OF FELLOWS. [illegible] Fellowship. 8.30 P.M., PATHOLOGY. Annual [illegible] Election of Officers and Council. [illegible] Castellani: An Amœba Living [illegible] of Certain
[illegible] Remarks on Its Peculiar Physio-
[illegible] Burt-White: Dissemination in
[illegible] of the Cervix. B. D. Pullinger:
[illegible] in Irradiated Human Tissue.
A. Eldino [illegible] the Injection of Irradiated
WEDNESDAY.— [illegible]
at the London School of Hygiene [illegible]
Keppel-street, W.C. Lecture [illegible]
R. T. Leiper: Helminthic Infections of Medical and Economic Interest. Tea at 4.30 P.M. 8 P.M., EPIDEMIOLOGY AND STATE MEDICINE. Paper: Dr. Robert Pierret: Present Situation in France of Biological Prophylaxis and Treatment in Certain Contagious Diseases, Especially Cerebro-spinal Meningitis, Measles, and Whooping-cough.
THURSDAY.—5 P.M., DERMATOLOGY. (Cases at 4 P.M.) Cases: Dr. H. C. Semon: 1. Case for Diagnosis. Other cases will be shown. 8.30 P.M., NEUROLOGY AND MEDICINE. Special discussion on the Functions of the Sympathetic Nervous System. Openers: Prof. H. H. Woollard, Dr. W. Russell Brain, Prof. Samson Wright, Dr. A. F. Hurst, and Dr. W. Langdon Brown. Other speakers will take part.
FRIDAY.—5.30 P.M., PHYSICAL MEDICINE. Clinical Meeting at the Royal Free Hospital, Gray's Inn-road, W.C. Short paper: Mr. P. Jenner Verrall: The Relationship of Orthopædics to Physical Medicine. 8.15 P.M., OBSTETRICS AND GYNÆCOLOGY. Short communication: Dr. G. I. Strachan: [illegible]
Papers: Dr. G. D. M [illegible]
Views on the Functi [illegible]
of the Corpus Luteum [illegible]
of Pregnancy. 8.30 [illegible] will be shown by Dr. P. Kerley, Dr. Courtner Gage, Dr. Stanley Melville, and Dr. Graham Hodgson. 9 P.M., Paper: Dr. J. F. Brailsford: Cholecystography. A discussion will follow which will be opened by Mr. Stanford Cade and Dr. Cochrane Shanks.

MEDICAL SOCIETY OF LONDON, 11, Chandos-street [illegible]
[illegible] —8.30 P.M., Discussion on Nor [illegible]
[illegible] to be introduced by Dr. Arthur A. Osman and Prof. O. L. V. S. de Wesselow.
WEDNESDAY.—9 P.M., Mr. F. A. Williamson-Noble: The Reactions of the Eye to General Disease. (The Lettsomian lecture.)

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE, 26, Portland-place, W.
THURSDAY, March 17th.—5.30 P.M., Opening of Manson House, 26, Portland-place, by the Prince of Wales. Admission by ticket only.—8.15 P.M., Laboratory Meeting at the Royal Army Medical College, Millbank. Demonstrations by Dr. C. C. Chesterman, Dr. G. M. Findlay, Dr. C. A. Hoare, Colonel S. P. James and Prof. Warrington Yorke, Dr. J. Neil Leitch, Dr. Llewellyn Lloyd, Prof. J. G. Thomson and Dr. Robertson, and others.

HARVEIAN SOCIETY OF LONDON.
THURSDAY, March 17th.—8.30 P.M. (at Town Hall, Paddington Green, W.), Sir Bernard Spilsbury: Pulmonary Embolism. (Harveian lecture.)

CHELSEA CLINICAL SOCIETY, Rembrandt Hotel, London, S.W.
TUESDAY, March 15th.—8.30 P.M. (preceded by dinner at 7.30), Prof. F. T. G. Hobday: Some Variations and Analogies in Human and Animal Surgery.

MEDICO-LEGAL SOCIETY.
[illegible] —8.30 P.M. (at 11, Chandos-street, W.), Dr. L. A. Parry: Abortion [illegible] gal, and Sociological Aspects.

EUGENICS SOCIETY.
TUESDAY, March 15th.—8.30 P.M. (at the Rooms of the Linnean Society, Burlington House, W.), Mr. J. Bickerton: Eugenics and Blindness.

LECTURES. ADDRESSES. DEMONSTRATIONS, &c.

ROYAL COLLEGE OF PHYSICIANS, Pall Mall East, S.W.
TUESDAY, March 15th.—5 P.M., Dr. C. E. Lakin: The Borderlands of Medicine. (Second Lumleian lecture.)
THURSDAY.—5 P.M. (Last Lumleian lecture.)

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.
MONDAY, March 14t [illegible] 19th.—Mon [illegible]
and Fri., M.R.C [illegible]
London Temper [illegible]
demonstrators o [illegible]
Wed., 8.30 P.M., [illegible]
Lecture by Dr. [illegible]
Clinical Medicin [illegible]
HOSPITAL, Vauxhall Bridge-road, S.W. [illegible] week.—Whole course in Proctology, all day, for one [illegible] 73, Welbeck
END HOS [illegible] at 5 P.M.
street, W [illegible] o-road, S
ROYAL [illegible] logy, all day
Course in [illegible] PITAL, Gre
—ROYAL [illegible] cs, all day
Portland- [illegible] chard, Ed
BETHLEM [illegible] A.M., Lect
Park, Bec [illegible] The above
Demonstration in Psychological Medicine. Courses are open only to Members.—CITY OF LONDON HOSPITAL, Victoria Park, E. Tues., 3 P.M., Demonstration of Chest Cases by Dr. K. Shirley Smith.—WEST OPHTHALMIC HOSPITAL, Marylebone-road, N.W. 5 P.M., Demonstration of Cases of Detachment of the Retina by Mr. J. Cole Marshall. Further particulars from the Fellowship of Medicine.

WEST LONDON HOSPITAL POST-GRADUATE COLLEGE, Hammersmith, W.
MONDAY, March 14th.—10 A.M. to 1 P.M., Gynæcological Ward Visit. Genito-urinary Operations, Skin Department. Surgical Ward Visit. 2 P.M. to 4 P.M., Operations. Surgical Ward Visit. Medical, Surgical, Eye, and Gynæcological Out-patients. [illegible] Demonstration
TUESDAY.—10 A.M. to 1 P [illegible] Surgical
[illegible] Medical
[illegible] Nose and Ear Out-patients.
WEDNESDAY.—10 A.M. to 1 P.M., Medical Ward Visit. 2 P.M. to 4 P.M. Children's Medical Out-patients. [illegible] Medical, Surgical, and [illegible] P.M., Venereal Diseases
THURSDAY.—10 A.M. to 1 P.M., Neurological Out-patients. Fracture Demonstration. 2 P.M. to 4 P.M., Operations. Genito-urinary, Medical, Surgical, and Eye Out-patients.
FRIDAY.—10 A.M., Medical Ward Visit. Skin Department. Dental Department. 12 noon, Medical Lecture

ADDRESSES AND ORIGINAL ARTICLES

THE PATHOLOGY AND TREATMENT OF ANÆMIA.

BY L. J. WITTS, M.D. MANCH., F.R.C.P. LOND.,
SISTANT PHYSICIAN TO GUY'S HOSPITAL; WILL EDMONDS CLINICAL RESEARCH FELLOW.

LECTURE III.

THE HÆMOLYTIC ANÆMIAS.*

> "A man's index of scepticism must indeed be low if he can believe that these terrible, acute anæmias are the result of chronic foci of infection in teeth or tonsils, and can bring himself to hope for relief from their eradication."
>
> R. C. LARRABEE.

ANÆMIA from hæmolysis or increased destruction f red corpuscles is uncommon. It presents problems f great difficulty. Cases are rare, and in the published eports essential details and investigations are lacking. knowledge that powerful hæmolysins can be elabrated by bacteria has prejudiced the approach to the roblem and prevented the orderly accumulation of acts. A natural confusion with anhæmopoietic næmias such as pernicious anæmia has been a further ar to progress. I propose first to discuss briefly hæmolytic anæmias whose pathology is understood. Afterwards, in the light of the knowledge acquired rom these anæmias and from our previous study of the erythron and its diseases, it may be possible or us to discern some unifying or distinguishing eatures in the hæmolytic anæmias of unknown origin which remain for consideration.

The most important group of hæmolytic anæmias s constituted by those of congenital or familial origin: acholuric family jaundice, sickle-cell anæmia, the erythroblastic anæmia of infants, and icterus gravis neonatorum. For information about acholuric jaundice I am fortunate in being able to refer you to our President's comprehensive studies.[15] Acholuric jaundice and sickle-cell anæmia are dependent on the presence of an abnormal type of corpuscle, which is ill-adapted to life in the blood stream, but the factors which determine the degree and the variations in hæmolysis are obscure. The pathology of the erythroblastic anæmia of infants is unknown.[77] Icterus gravis neonatorum is a most interesting disease, which may shed light on the mechanism of the acute anæmic breakdowns of later life and which therefore deserves rather longer mention. In this grave familial jaundice, successive infants in a family become jaundiced a few hours to a day after birth. They become progressively anæmic, pass into a drowsy condition, and usually die in a few days or weeks. The disease resembles physiological jaundice in its onset, and, like it, it does not show any gross post-mortem appearances to account for the jaundice.[61] During intra-uterine life the red cells circulate in higher concentration than after birth to compensate for the poor supply of oxygen from the placenta. It is probable that physiological jaundice results from the hæmolysis of superfluous corpuscles on the adoption of pulmonary respiration, and that grave familial jaundice is a morbid exaggeration of this process. Affected children nearly always died till Hampson showed that they could be cured by the injection of normal human serum, and that after this they developed normally. This is a close parallel to the striking effects of transfusion in the acute anæmic breakdowns of later life. In conclusion, we may observe that liver is of little or no value in any of these familial hæmolytic anæmias. The decrease in hæmolysis and the improvement in the patient which follows splenectomy in acholuric jaundice are well known. Unfortunately this operation seems to be of no such constant assistance in sickle-cell anæmia or in the erythroblastic anæmia of infants.

CAUSES OF HÆMOLYTIC ANÆMIA.

Hæmolytic anæmia may be the result of a variety of infections[39] and organic or inorganic poisons. It is exceedingly uncommon for the ordinary streptococci to cause a hæmolytic anæmia; anaerobic streptococci, such as are often responsible for puerperal fever, are more potent, but the organism which stands out above all others is *Bacillus welchii.* In gas gangrene profound anæmia may develop in a few days or hours, the red cells are destroyed so rapidly that hæmoglobin and its derivatives may appear in the urine, there is frank jaundice, the white cells are increased to 50,000 or more, and myelocytes appear in the blood. In the effort to repair this sudden destruction of red cells, erythroblasts of the most primitive type are poured into the blood stream and there is a great reticulocytosis. Recovery is rapid and spontaneous if the infection is overcome. In these anæmias from infection, there is rarely any doubt about the presence of a gross infection and the organisms can be cultivated from the blood. It must be remembered that anæmic patients are very unresistant to infection, especially by streptococci, and many mistakes have been made in attributing anæmia to infection, when a more careful history would have shown that the infection was the complication or termination of a pre-existent idiopathic anæmia.

Hæmolytic anæmia has been described in typhoid fever,[36 66] disappearing when the disease was cured, but here there is the possibility that the condition was an Addisonian anæmia due to the disease of the alimentary tract and not a hæmolysis. There is, however, one infection both in man and animals, of which the most characteristic feature is a hæmolytic anæmia. In bartonella infection,[70] which in man is known as Oroya fever, the red cells are invaded by the organisms and broken up, often with resultant hæmoglobinuria and jaundice. A profound anæmia of a megalocytic type soon develops, and again there is a leucocytosis and the outpouring of immature red and white cells from the marrow. We must all agree that these hæmolytic anæmias, in which the red cells are destroyed by the direct action of organisms or their poisons, are extremely uncommon except for gas gangrene and puerperal fever. Equally uncommon is hæmolysis by the direct action of poisons such as the aniline derivatives, though it may occur in industrial accidents and in suicides, and it is identical with the effects of bacterial hæmolysins.

More frequent are the hæmolytic anæmias which appear to be the result of an infection or harmful agency, such as the paroxysmal hæmoglobinuria of syphilis and the blackwater fever of malaria. Here the infecting organism does not act directly on the red cells, but apparently produces a

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* The third Goulstonian Lecture for 1932 delivered before the Royal College of Physicians of London on March 8th. Lectures I. and II. have appeared in previous issues of THE LANCET.

Notes, Comments, and Abstracts

PROSTATIC CALCULI.

J. A. Lazarus and A. A. Rossenthal,[1] of New York state that 370 cases of prostatic calculi have been reported, although many more are encountered than are published. Until the introduction of radiography in routine urological examinations prostatic calculi were supposed to be rare, but modern methods of exploration have shown that they are not uncommon. As regards their ætiology the writers hold that calculi of the prostate, like those found elsewhere in the body, are due to a variety of causes. As a rule a pre-existing infection of the gland in a man with a tendency to calcium deposition seems to be the most likely explanation of calculus formation. The calculi vary in size, consistence, and chemical composition. The nucleus usually consists of epithelial debris, blood clot, bacteria, corpora amylacea, or necrotic tissue, and the surrounding layers are made up of calcium phosphate, calcium carbonate, calcium oxalate, and ammonio-magnesium phosphate. Most prostatic calculi are found in the lateral lobes, *and the median lobe is an occasional site*, but the anterior and posterior lobes are rarely, if ever, involved. The calculi are usually multiple, but 33 cases are on record in which only a single stone was found. Most of the cases occur after puberty, the majority being found in the fifth decade, and two-thirds of all the cases in the fourth, fifth, and sixth decades. In the writers' series of 15 cases the youngest patient was 28 and the oldest 75. In many cases prostatic calculi give rise to no symptoms but are accidentally discovered in a routine urological examination by X rays and rectal exploration. In a fair number however the following symptoms are met with in order of frequency: diurnal and nocturnal pollakiuria, dysuria, perineal, penile, and rectal pain, urgency and tenesmus, hæmaturia, retention, impotence, and hæmatospermia. The diagnosis is established by rectal examination and X rays. Prostatic calculi must be distinguished from chronic prostatitis, with hard, nodular, inflammatory, or malignant infiltration, or tuberculosis of the prostate. Complete recovery follows removal of the calculi. If the condition is left untreated, abscess formation, cystic degeneration, gangrene, or carcinoma may result. Suprapubic prostatectomy in two stages is regarded as the operation of choice, but if no symptoms are present, diathermy followed by massage of the prostate is sufficient.

AËDES EGYPTI AT BAKU.

How clever are female mosquitoes at finding safe and secret places for their eggs. *Aëdes egypti* (formerly called *Stegomyia fasciata*), which lives about human dwellings, affords an example. It has been widely reported from the Black Sea coast, but only now[2] from the Caspian, by Dr. I. Achundow, entomologist to the Baku Tropical Disease Institute, who was anxious to determine if this yellow fever carrier occurred in his area. He was lucky when a female flew into his room last July and, being caught, laid 30 eggs from which in ten days—temperature of the aquarium water 77° F.—there developed two male and three female undoubted *Aëdes egypti* imagos. About this time, as he was calling on a relative who lived in the centre of the town, Dr. Achundow was bitten by an aëdes, and, as mosquitoes were said to be a plague in that flat, though on the third floor, search was made, and in the back kitchen, under a pile of wood fuel, was found a wooden washing tub (a quarter full of water to keep it from warping) teeming with aëdes larvæ. A similar finding was made in other neighbouring flats. They do their washing in Baku every two or three weeks, and the mosquitoes have double that time if the family is holiday.

Thus we see how thoroughly mosquito inspectors must know the customs of the people they are protecting. Who would have expected to find a mosquito breeding place on a third floor? Another thought: how many vain journeys a pregnant aëdes must have made to the woodpile before she found the family wash was over and the tub, with its welcome water content, returned into store!

PHYSICAL EXERCISES FOR THE MIDDLE-AGED

THE indiscriminate daily practice of physica exercises by the middle-aged does not always have favourable effect on general condition, and ma certainly do harm if the exercises are such as t cause undue strain. Many modern gymnastic however, can be adapted for older people, an graduated training in suitable physical exercise undoubtedly makes for general wellbeing. Mi M. H. Spalding, late vice-principal of the Bergma Österberg Physical Training College, has started sma classes for physical culture at 105A, Gloucester-road London, S.W.7, which are specially arranged fo women who have few, if any, facilities for game or sports, and *have difficulty in securing* regula exercise. Separate classes for men are also organise The scheme of exercises is based on the preventiv rather than the curative aspect of physical culture.

Appointments

ABERNETHY, W. R., M.B., B.Ch. Belf., D.P.H., has be appointed Superintendent M.O.H., Executive Sanita Officer, Schools Medical Officer, and Tuberculosis Offic of Derry.

PADDINGTO HOSPITAL: Mr. DUNC C. L. M.D., F.R.C.S., Consu ing Su ; Mr. BERTRAM SAMU L.D.S. R.C.S., Consulting Dental Surgeon to the Hospita Mr. C. E. SHATTOCK, M.D., M.S., F.R.C.S., Surgeon in charge of In-patients; Mr. F. W. M. PRATT, M.B., B. F.R.C.S., Honorary Surgeon to Out-patients; and Mr. H PITT, L.D.S. R.C.S., Honorary Dental Surgeon.

Certifying Surgeons under the Factory and Workshop Ac

Hogben, G. H., L.R.C.P. Lond., M.R.C.S. (Swinton, Lancs

Murray, J. D., M.B. Ch.B. Aberd. (Grays, Essex).

Births, Marriages, and Deaths

BIRTHS.

APPLIN.—On March 5th, at Park-lane, Croydon, the wife H. W. Applin, M.B., B.S., M.R.C.S., of a son.

HARKNESS.—On March 7th, at Devonshire-place, W., the w of R. C. Harkness, F.R.C.S., of a daughter.

HUNTER.—On March 2nd, at Lindfield-gardens, N.W., wife of Dr. Donald Hunter, of a daughter.

PALMER.—On Feb. 29th, the wife of Dr. H. M. Palmer, Wealden Stow, Bidborough, Kent, of a daughter.

WAKLEY.—On Feb. 17th, at Playden, Chipstead, Surrey, Daisy (*née* Trist), the wife of Thomas L. Wakley daughter.

MARRIAGES.

HOWAT—RICKETTS.—On March 4th, at Enfield, Clarence H Howat, M.B., Ch.B., to Audrey May Ricketts.

DEATHS.

CAMPBELL.—On March 1st, at Brompton Hospital, London, Dr. R the result of wounds received during the Great War,

GRA Eveline Dorothy (Sister La bery Hill, Birmingham, in 48th year.

HOAR.—On March 6th, at Montcalm, Maidstone, Cha Edward Hoar, M.D. Lond., J.P., in his 85th year.

IRVING.—On Feb. 27th, at Bell-street, Henley, Hamil Irving, M.S., F.R.C.S., of Huddersfield.

MACVICAR.—On Feb. 27th, Acharacle, Arg Dr. Symers Douglas

MORGAN.—On March 2nd, gan, M.R.C L.R.C.P., aged 35.

REYNOLDS.—On March 4th., Lieut.-Colonel J. H. Reynol V.C., late R.A.M.C., aged 88.

SYDENHAM.—On March 7th, at Pitt House, Dawlish, Dev George Mervyn Sydenham, M.D., aged 62.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices Births, Marriages, and Deaths.

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[1] Urol. and Cut. Review, February, 1932, p. 99.

[2] Arch. f. Schiffs- u. Tropen-Hygiene, January, 1932, p. 31.

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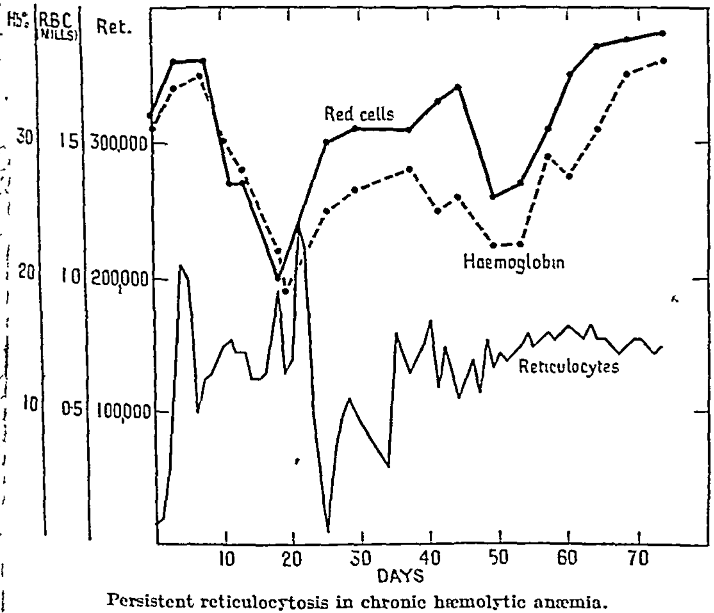
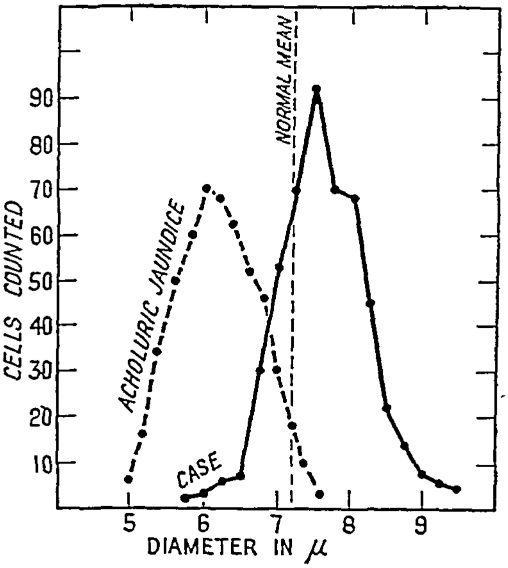
Fig. 1.



Persistent reticulocytosis in chronic hæmolytic anæmia.

Fig. 2.



Price-Jones curves in chronic acquired hæmolytic anæmia and in acholuric jaundice.

Acute Hæmolytic Anæmia.

In discussing these plastic anæmias Nobécourt refers to several cases of the same type he has encountered in later childhood and in adults. From a study of the literature and of a series of cases observed by R. J. L. O'Donoghue and myself at Guy's Hospital, I have felt that it will be profitable to collect them together change in the patient's organism, which leads to hæmolysis under special conditions of temperature, medication, and so on. Closely related to these diseases is Fabismus, a hæmolytic anæmia found in Italy, which follows the ingestion of beans (*Vicia faba*) or even the inhalation of their pollen.[60] It is probably due to sensitisation to some constituent of the plant. Nothing happens to the patient on first eating the beans or coming into contact with the plant, but on the second occasion, perhaps months later, there is a rapid hæmolysis of the red cells, often with hæmoglobinuria and always with anæmia. Finally we may mention the hæmolytic anæmia which may develop in man and animals as the result of frequent transfusion with a perfectly compatible blood. An animal so treated learns to dispose of the transfused cells with increasing celerity, and in certain cases the hæmolytic process may not stop at the destruction of the superfluous cells but may progress and produce a severe hæmolytic anæmia.[63]

CHARACTERISTICS OF HÆMOLYTIC ANÆMIA.

We are now in a position to describe the characteristics of a hæmolytic anæmia. It may develop with very great speed and then disappear as soon as the hæmolysed cells can be replaced, or it may be chronic and persistent, or it may run a chronic course with periodic exacerbations. If a great many red cells are broken down in a short time, there are hæmoglobinuria and jaundice, but in chronic hæmolytic anæmia it is sometimes surprising how slight is the jaundice. The colour-index varies according to the mode of reaction of the bone-marrow but it is usually round about unity and there may be frank megalocytosis. Owing to the vigorous attempts of the bone-marrow to repair the anæmia, the reticulocyte count is high, and nucleated red cells and even megaloblasts appear in the peripheral blood. The fragility of the red cells varies in different individuals and at different times in the same individual. The resistance to hypotonic saline may be diminished in acquired hæmolytic anæmia, and it may be normal in congenital acholuric jaundice.[15] In chronic hæmolytic anæmia the white cells are unaffected or a little diminished. When hæmolysis is acute and rapid, there is a leucocytosis during which very immature white cells may appear in the peripheral blood; the platelets first fall and later rise above their normal level. Apart from the hæmolysis, which gives rise to the depressing effects of anæmia, enlargement of the liver, spleen, and occasionally of lymph glands, hyperplasia of the bone-marrow and hæmosiderosis, there are no signs of systemic disease, and the alimentary tract and nervous system are normal. In the ætiology of these anæmias we can distinguish three different kinds of factor: first, a hereditary dystrophy of the erythron; second, immediate destruction of erythrocytes by micro-organisms, toxins, and chemical agencies; third, hæmolysis from morbid changes in the body fluids and the reticulo-endothelial system, which may be the result of infections, poisons, or other agencies.

Chronic Acquired Hæmolytic Anæmia.

I have thought it unwise to attempt any formal classification of the obscure, hæmolytic anæmias which remain to be considered, and I shall merely divide them into two groups. In the first group, which I shall call *chronic acquired hæmolytic anæmia*, the hæmolytic process persists once it has been established, though it is often subject to periodic exacerbations. In the second group, which I shall call *acute hæmolytic anæmia*, the disease is self-limited, and if the patient survives the crisis of the illness, complete recovery occurs in a few months or at any rate within a year. I can best describe chronic acquired hæmolytic anæmia by reporting the following case:—

A woman, aged 20, was admitted to Guy's Hospital on April 18th, 1931. Her illness began suddenly in March, 1929, with the passage of bloody urine, followed in 24 hours by jaundice. The hæmoglobinuria persisted for five days and left her extremely weak, so that she was unable to rise from her bed for six weeks. Her previous history was negative, and no other member of the family had ever had anæmia or jaundice. Similar attacks occurred at Christmas, 1929, and in March, 1930. She was not strong enough to travel till June, 1930, when she was taken to a hospital and transfused on account of her grave anæmia. A hæmolytic crisis followed the transfusion and she was not improved. Another spontaneous attack occurred a week before her admission to Guy's Hospital. In addition she was then three months' pregnant.

She had a severe anæmia, red cells 1,480,000 per c.mm., hæmoglobin 27 per cent., colour-index 0·9, white cells 4000, platelets 120,000. The differential white count, and the clotting and bleeding times were normal. The mean diameter of the red cells was 7·8 microns. Van den Bergh's reaction was only faintly positive. The resistance of the red cells to hypotonic saline was normal at the first examination (0·45/0·35), but two and a half months later it was diminished (0·55/0·45). Wassermann's reaction was negative and the blood did not hæmolyse on exposure to cold. Physical examination was negative except for anæmia and a spleen two fingers below the costal margin. There were no alimentary symptoms and the test-meal was normal. The urine was chemically and microscopically normal and contained no iron pigment. X rays, cystoscopy, and renal function tests revealed no disease of the kidney. She aborted nine weeks after admission with slight clinical improvement.

The course of the anæmia during the three months she was in hospital is shown in Fig. 1. Massive doses of iron and liver had no effect. The reticulocyte count was always high, but in spite of a reticulocytosis more than ten times the normal, the red count did not rise. Blood formation was much accelerated and the persistence of the anæmia can only be explained by persistent excessive hæmolysis. Now, seven months later, there have been no more acute hæmolytic crises and the blood count is: red cells, 2,570,000 per c.mm.; hæmoglobin, 50 per cent.; colour-index, 0.9; white cells, 3600; reticulocytes, 8 per cent. Her Price-Jones curve, which showed a high normal red cell diameter, is contrasted in Fig. 2 with an acholuric jaundice curve published by Hampson and Warner.

The disease is rare, and only two cases have been admitted to Guy's Hospital during the last ten years. P. N. Panton and co-workers described three cases, in addition to two closely related non-syphilitic paroxysmal hæmoglobinurias, in a review of a series of grave anæmias which included 117 pernicious anæmias. Isolated cases have been described by many authors and small groups of cases by Adler, Bergmark, and Micheli (1930). The mixed series of cases of non-Addisonian hæmolytic anæmia reported by L. S. P. Davidson and by G. W. Goodhart also include examples. The disease appears at all ages, most often in young adults. The anæmia is often severe, the colour-index variable but usually about unity. The most striking feature is the great and persistent increase of reticulocytes. Nucleated red cells including megaloblasts are often seen. In perhaps half the cases there are periodic exacerbations of hæmolysis, productive of hæmoglobinuria and jaundice. At these times there may be leucocytosis and occasional myelocytes, but in the chronic phase white cells are rather diminished in numbers. The spleen may or may not be enlarged. Nutrition and digestion are normal. The disease may prove fatal after a course of several years. Post mortem "the characteristic changes of pernicious anæmia are found."[53] Micheli (1931) has separated under the title of hæmosiderinuria a group of cases in which the liver and spleen are not enlarged, iron pigment is present in the urine, and hæmosiderosis is concentrated in the kidney. Detailed classification of s type is premature when knowledge is so imperfect, l Panton showed that iron pigmentation might be efly localised in the skin.

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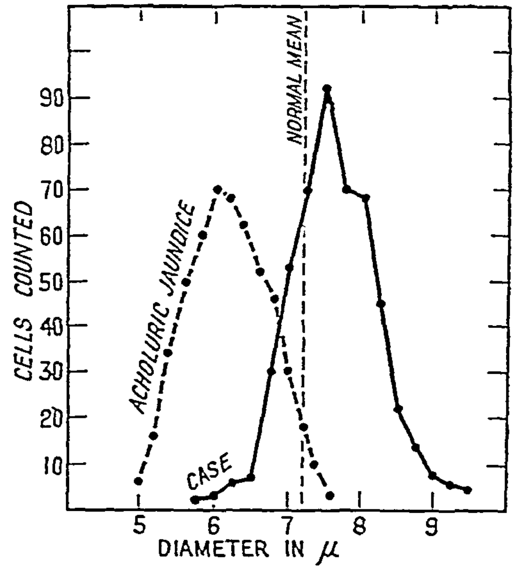

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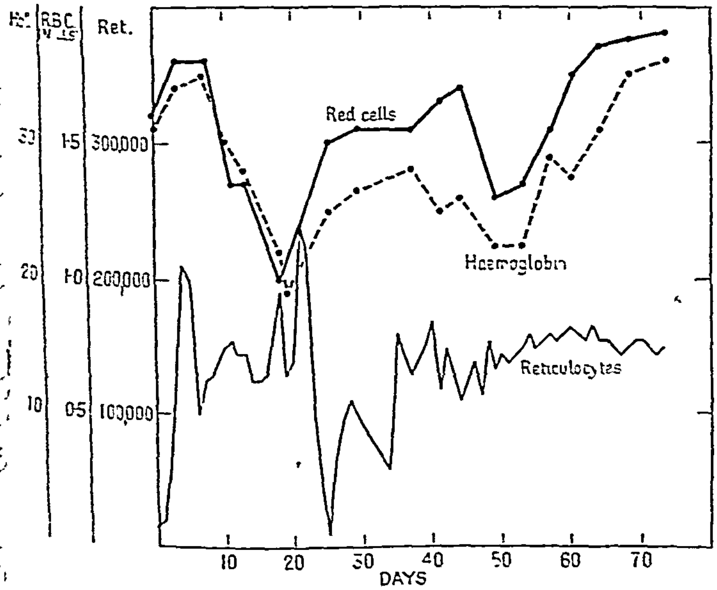

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In discussing these plastic anæmias Nobécourt refers to several cases of the same type he has encountered in later childhood and in adults. From a study of the literature and of a series of cases observed by R. J. L. O'Donoghue and myself at Guy's Hospital, I have felt that it will be profitable to collect them together and discuss them in some detail. Our subject opens in the year 1900, when Leube reported a case of rapidly fatal anæmia in a boy aged 10, whose peripheral blood showed anæmia of high colour-index with normoblasts and megaloblasts and only moderate increase in white cells, while the morbid changes after death were those of acute leukæmia. He suggested the possibility of a disease which combined the features of leukæmia and pernicious anæmia, and gave it the name leukanæmia. With accessions of knowledge and the reorientation of hæmatology in recent years, much of the controversy which followed Leube's paper has become meaningless, and the term leukanæmia should be banished from our writings. Cases diagnosed leukanæmia were leukæmia with secondary disturbance of the erythron, or pernicious anæmia with secondary myeloid effects, or perhaps most commonly they were acute hæmolytic anæmia of the type which we are now considering. The important result was the publication of a number of cases of grave anæmia which were characterised by simultaneous and profound disturbance of the erythroblastic and myeloid tissues, and which differed biologically from the incurable diseases pernicious anæmia and leukæmia in that they might recover completely and permanently.

The thesis I wish to present is that the cases variously described as acute hæmolytic anæmia (Lederer), acute febrile anæmia (Brill, Benhamou, Moschcowitz), acute leukæmia with recovery, acute pernicious anæmia with recovery, many of the so-called septic or non-Addisonian hæmolytic anæmias, and many of the plastic anæmias of childhood, should be regarded as examples of one and the same disease or morbid process. *I shall also suggest that the acute hæmolytic anæmia of pregnancy is the same disease occurring with special frequency in the pregnant woman, and I shall show that in clinical features and hæmatology it is identical, differing only in its resistance to treatment while the fœtus is in utero.* The disease may vary greatly in acuteness and in the *emphasis of individual symptoms*, but in clinical course, blood picture, pathology, and treatment, the cases form a coherent group, in which the differences shade imperceptibly from one case to another. Parkes Weber has aptly termed them acute anæmic breakdowns, and it will be helpful to future research if we discuss their natural history and pathology in an objective fashion. The disease is rare and we have had only six cases during the last ten years at Guy's Hospital, of which the following is a typical example:

A man, aged 42, was admitted to Guy's Hospital with jaundice and anæmia in June, 1922. His illness had begun suddenly with a slight rigor five weeks before. His previous health had been good except for malaria when he was soldiering in India. A paternal uncle was said to have died of jaundice, and of his ten children, five had died young, two of jaundice. He had not been in contact with any chemical or known poison. The temperature was raised to 100° for two days after admission and thereafter was normal. He had general yellow jaundice and the spleen was just palpable. The fæces were normally pigmented, the urine contained urobilin, no bile. The test-meal was normal. The indirect van den Bergh reaction was positive. Without any treatment he made a rapid improvement as shown in Table I. Nine years later he had remained perfectly well, and physical examination was negative. The blood count and the fragility of the red cells were normal and the van den Bergh reaction was negative.

The disease affects males and females equally. It occurs at all ages but is more common in the first and second decades. The onset is often abrupt with fever, influenzoid symptoms, sore-throat, or biliousness. *Hæmoglobinuria* has been described but is unusual,[38] and there is a variable degree of jaundice. The pace of the disease varies, and it may be only a few days or on the other hand several weeks before the anæmia attracts attention. By this time the red cells have fallen below two million and may be *only a few hundred thousand*. The colour-index is about unity. The diameter of the red cells is sometimes diminished, sometimes increased. There is a high reticulocytosis, often 30 per cent. or more, and large numbers of megaloblasts and normoblasts may appear. The fragility of the red cells may be normal, or it may be increased, *returning to normal* when the anæmia is repaired. Van den Bergh's reaction is positive. The white cells are often much increased in number and immature cells may enter the circulation and simulate leukæmia. The platelets are diminished and petechiæ, purpura, or spontaneous hæmorrhages may develop.

TABLE I.

Date.	Red cells.	White cells.	*Hb.* %.	Colour index.
12/6/22	696,000	—	22	1·6
16/6/22	1,688,000	6,420	36	1·1
19/6/22	2,384,000	—	44	0·9
22/6/22	3,400,000	—	50	0·7
27/6/22	2,856,000	—	58	1·0
30/6/22	3,150,000	—	56	0·9
22/7/31	4,800,000	6,000	89	0·9

Normal resistance to [illegible] saline was found by Christiansen, Fiessinger [illegible] Weber; low resistance by Holst, [illegible] 0·80/0·19, Benhamou, 0·52/0·40, rising to 0·46/0·38 on recovery.

Weber's patient, aged 11, had 25,000 white cells, of which 71 per cent. were lymphocytes, 17 per cent. normoblasts, and 5 per cent. megaloblasts. Lederer's patient, aged 24, had 44,000 white cells, of which 1 per cent. were myelocytes, *8 per cent. normoblasts, and 1 per cent.* megaloblasts. Holsti's patient, aged 37, had 45,000 white cells, of which 79·7 per cent. were myelocytes. Teeter's patient, aged 6, had 133,000 white cells with 11 per cent. myelocytes, 6 per cent. myeloblasts, and many normoblasts and megaloblasts. All these patients made a permanent recovery.

The clinical picture is that of a severe systemic infection. The temperature ranges from 99° to 105°. The face is swollen and the *limbs often* œdematous. Red patches like Osler's nodes sometimes develop on the hands, and subcutaneous blebs on the limbs and elsewhere. The colour is pale, café-au-lait, lemon-yellow or jaundiced, but as a rule the patient is more anæmic than icteric. The test-meal is normal. The liver, spleen, and less often the glands in the neck, axilla, and groins, may be enlarged. If there is a hæmorrhagic tendency, retinal hæmorrhages, epistaxis, gingivitis, hæmatemesis, or melæna occur. The urine may contain a trace of albumin, a few red or white corpuscles, and much urobilin. The condition of the heart may cause difficulty in diagnosis:—

> "As the anæmia progresses the first sound at the impulse becomes short and abrupt, and if in addition it is slightly reduplicated the simulation of mitral stenosis is very close. We have not detected in such cases a definite thrill, but there is invariably a soft systolic murmur after the abrupt first sound. When the degree of anæmia is very profound, a diastolic murmur may also become evident at the base, with its maximum usually just to the left of the sternum in the second intercostal space. When in addition there are fever, purpura, and enlargement of the spleen, the resemblance to a progressive endocarditis is so close as to give rise to the greatest difficulty in diagnosis. It is equally remarkable when there is improvement in the anæmia, how completely these cardiac signs alter and return to the normal."[59]

In addition there may be a pericardial rub. With all these symptoms, so suggestive of a septicæmia, the blood culture and the serum reactions to all known organisms are negative. The mortality of the untreated disease is probably about 50 per cent. The fever lasts from a few days to several months l there is no hard-and-fast line between the acute l subacute cases. As long as the temperature is ied, hæmolysis seems to be active, for anæmia l reticulocytosis persist, but if the patient survives crisis, recovery is spontaneous, complete, and manent. In cases coming to autopsy there are lespread fatty degeneration and iron pigmentation the viscera. Hæmorrhages may be present in the in and elsewhere. The spleen is large, and in the ite cases dark and red and soft. its sinuses engorged th blood. The bone-marrow is hyperplastic, roon coloured or like red-currant jelly, and it itains many megaloblasts and usually myelocytes o. In Moschcowitz's case there were hyaline thrombi many organs, composed of agglutinated red cells, d in other cases sterile infarcts of the spleen and eptic necroses of the lymph glands have been found. icteriological examination is negative except for few cases explained by contamination.

In the treatment of acute hæmolytic anæmia iron, senic, and removal of septic foci do no good. Liver is been introduced too recently for its value to be sessed and it has been used only in cases which might ell have recovered by their own forces. The most riking feature of the treatment of acute hæmolytic iæmia is the dramatic effect of transfusion, often served in patients who seemed moribund. The mperature falls and a rapid recovery sets in. More ian one transfusion may be necessary to arrest the æmolytic process, but in cases properly treated by ransfusion, death is a rare event. This specific ction of transfusion is observed in no other blood isease except the hæmolytic anæmia of pregnancy, hough there is a parallel in the cure of icterus gravis ieonatorum by serum. With this observation I shall eave theoretical consideration of acute hæmolytic anæmia till I have discussed the hæmolytic anæmia of pregnancy.

(*To be concluded.*)

DISSEMINATED SCLEROSIS.

CLINICAL AND SEROLOGICAL OBSERVATIONS DURING EXPERIMENTAL VACCINE TREATMENT.

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IN March, 1930, one of us [1] published a preliminary article describing some results of treatment in disseminated sclerosis by means of an autogenous vaccine prepared from the cerebro-spinal fluid.

The bacteriological basis on which this treatment was originally founded was the presence of a characteristic ultra-microscopic spherula, described in the same number of THE LANCET by Miss K. Chevassut [2] as occurring in the cerebro-spinal fluid of patients suffering from disseminated sclerosis when this fluid was incubated with Hartley's broth and human blood-serum. According to Miss Chevassut, this characteristic spherula was observed by her in 176 out of 189 cases (i.e., a percentage of 93 per cent.), whilst in a control series of 269 cases, comprising normal persons as well as patients suffering from other organic nervous maladies, she recorded uniformly negative results. The occurrence of a positive colloidal gold curve, similar to that already noted by previous observers, was confirmed. In addition, she described a characteristic acid wave as occurring in cultures of the spherula, claiming that the pH of such cultures underwent a temporary reduction from 7·6 to 7·0, lasting for about five days before returning to the previous level; subsequent to which the alkalinity increased up to about 8.

This bacteriological work has most properly been subjected to critical examination by independent workers. The results are conflicting. Confirmatory observations as to the presence of the spherula in disseminated sclerosis and its absence in control cases were published by Smith and Ransome,[3] of Liverpool, who found the spherula present in 11 out of 12 cases of disseminated sclerosis and absent in control cases; also by von Sarbó,[4] of Budapest, who found the spherula present in over 100 cases. On the other hand, Carmichael,[5] of London, consistently failed to find the spherula in a series of 19 cultures from cases of disseminated sclerosis, although he, like Miss Chevassut, had the advantage of consultation with Mr. J. E. Barnard as regards the necessary ultra-microscopic technique. Carmichael also failed to observe any acid wave in broth cultures of the spherula. His estimations, however, of the pH were made by using a rocking electrode instead of the bubbling electrode used by Chevassut, and cannot therefore be regarded as strictly comparable. Carmichael's observations on the colloidal gold curve were in agreement, broadly speaking, with those of Miss Chevassut and of other observers.

Further critical observations on the bacteriological side of the research have since been forthcoming from various other sources. These are at variance in several respects, not only with Chevassut's but also with Carmichael's work. Thus, for example, Lépine and Mollaret [6] in Paris demonstrated the presence of an ultra-microscopic spherula, not only in 12 cases of disseminated sclerosis but also in six control cases from other organic nervous diseases, and even in Hartley's broth without admixture of cerebro-spinal fluid, and also in the aqueous humour of the rabbit after injection of a drop of human serum. They failed to confirm the occurrence of an acid wave in cultures from the cerebro-spinal fluid in disseminated sclerosis. They came to the conclusion that the ultra-microscopic spherula was probably not a living virus, and nor was it a specific appearance in disseminated sclerosis. Tronconi [7] in Pavia and Hicks and Hocking [8] at Westminster have also demonstrated the presence of a spherula in various degenerative diseases of the central nervous system other than disseminated sclerosis. The observations of one of us (F. D. M. H.) are, in the main, in agreement with these latter observers.

For reasons already set forth,[9] [10] we have dissociated ourselves from Miss Chevassut. The research, however, has been continued in our special laboratories at Westminster Hospital Medical School. This present paper of ours is based upon observations on a further series of 101 consecutive cases of disseminated sclerosis examined clinically and serologically within a period of six months from March to September, 1931.

CLASSIFICATION OF CASES.

Our 101 cases, of which 22 were early, 62 moderate, and 17 advanced, have been classified, not according to the duration of their signs and symptoms, but according to the stage of the malady which had been reached when the patient first came under observation.

By this standard, an *early* case is one in which the physical signs, whilst sufficiently definite to establish a positive diagnosis (e.g., an extensor plantar response, pallor of one or both optic discs, nystagmus, absence of one or more abdominal reflexes, &c.), are so slight as not to interfere in any way with the patient's ordinary daily activities. Twenty-two of our cases belonged to this category. Amongst them were included several patients whose first symptoms dated back 14, 13, and 11 years respectively; others had only shown symptoms for five or six months, whilst the average duration of these early cases was four years.

A *moderate* case, according to our classification, is one with well-marked physical signs and symptoms, evident not only to the physician but also to the patient and his friends (e.g., weakness, spasticity or ataxia of the upper or lower limbs, visual impairment, diplopia, increased tendon-jerks, clonus, &c.), but in which the patient is still capable of carrying on his daily occupation and of earning his living. Sixty-two of our present series of 101 cases belonged to this moderate class, and had an average duration of 7·8 years.

An *advanced* case is one in which the patient's physical disabilities are so severe as to remove him from the class of active citizens, so that he is no longer able to carry on his ordinary occupation but has become an invalid, dependent on his family or friends, getting about with support or even confined to a chair. In our present series 17 cases, by the time they came under observation, were in this advanced stage. The duration of their symptoms varied from less than a year in two acute fulminating cases, up to 28 years in the case of longest standing. The average duration of these advanced cases before coming under observation was 9·3 years.

All the foregoing 101 cases were treated by repeated courses of an autogenous "vaccine" prepared from the spherula cultured in the cerebro-spinal fluid. In most cases this was made according to the method detailed by Hicks and Hocking[11] in doses graduated from 1 million to 200 millions or more. In some cases, however, a simpler volumetric method, as described by von Sarbó,[4] was used, with a weekly dosage ascending from 1 to 10 c.cm. The ordinary duration of a vaccine course was 12 weeks. Before starting a fresh course careful observations, clinical and serological, were carried out in every case.

It should be emphasised that whenever the term "actively growing" or "positive" culture is made in the present paper, it is meant that such cultures show a progressive increase in the number of observable spherules and granules by dark-ground illumination, and not that these particles necessarily constitute either a virus or a living organism.

In view of our uncertainty as to whether the spherula is a virus or merely a biochemical precipitate, we frankly admit that the accuracy of the word "vaccine" is open to criticism. For convenience, however, we have preferred to retain the term for the present.

SEROLOGICAL OBSERVATIONS.

Before detailing the results of our serological investigations, we think it desirable to define the appearances which in our opinion constitute a "positive" culture, as contrasted with one or other of the filtrable contaminants for which it might be mistaken.

Cultural Observations.—One of us (F. D. M. H.), in conjunction with Braxton Hicks,[8] has already drawn attention to the fact that for the satisfactory demonstration of the spherula, the necessary cultural conditions are less strict than those originally described by Chevassut.

Mixtures of normal human serum 3 parts with Hartley's broth 5 parts, after passage through a Berkfeld or Seitz filter, yield a fluid which is optically clear, both to the naked eye and when viewed microscopically by dark-ground illumination. Occasionally a few faintly illuminated granules may be seen showing active Brownian movement, or an unresolved haze; these appearances we regard as filtrable contaminants. On incubating the mixture up to a period of 14 days, no alteration in optical properties occurs, except perhaps that the filter-passing contaminants, if present, may increase in numbers. Such non-specific bodies, all of them feebly illuminated, appear as granules, spheres, or ovoid bodies, the latter being about twice the diameter of the spherule commonly seen in disseminated sclerosis.

When the broth-serum mixture is incubated with cerebro-spinal fluid from a case of disseminated sclerosis a change occurs, sometimes within 24 hours, sometimes only after longer periods—e.g., not until after seven days' incubation. This change consists of a naked-eye opalescence which develops in the incubated tube as opposed to a persistence of clarity in the control tubes. The opalescence becomes more pronounced as incubation continues, but no actual precipitate forms. On microscopical examination with dark-ground illumination, this opalescence is seen to be due to the presence of brighly illuminated spherules of varying sizes up to about 0·25 μ in diameter. The larger spheres reflect light only from their periphery, thus appearing as bright rings each surrounding a central dark space. In the smaller spheres the central dark space is reduced to a mere dot, whilst still smaller particles appear as bright granules only. In addition, a number of more faintly illuminated particles, still smaller, are observed. At this stage of incubation there is no tendency for the particles to aggregate together, and they are actively motile with a characteristic vibratile Brownian movement. When left illuminated on the microscopic stage for long periods—e.g., an hour or more—most of these particles appear to settle down and lose their movement, even when drying of the preparation is prevented by sealing down the cover-slip. A similar but transient slowing or cessation of movement has been described by Guardincerri (in a private communication to us) when cultures are exposed to the action of ether or chloroform vapour. In such circumstances he has noted the return of motility when the effects of the vapour have worn off. So far, we have not been able to reproduce this phenomenon.

As incubation proceeds, both spheres and granules increase in numbers, the former at a greater rate than th latter. It is conceivable, therefore, that the process i one of gradual development from granule into spherule A tendency to aggregation of particles may now be observed in which relatively large spherules are seen to which ar attached both granules and smaller spherules. This proces of aggregation is never a very marked feature of thes cultures, it being rare to see a total of more than four o five elements thus aggregated. Large colonies, such a those originally described by Chevassut, have not bee observed by us, whether in serum-broth cultures or by th agar-slip method devised by Welch.[12]

Finding ourselves unable to corroborate the presence o these large colonies, both von Sarbó and ourselves hav accordingly discarded the slip method of examination, an now rely upon the appearances developing in liquid cultures

Whilst aggregation occurs as above described, no coalescence of particles to form large single bodies or droplet has been noted by us. Each particle appears to attain it maximum size (approximately 0·25 μ to 0·3 μ), and the remains discrete. It is possible that this aggregation o agglutination phenomenon is due to adsorption of protei on the surface of the developing spherules, thus formin around them a skin of precipitated albuminous materia differing in composition from the main bulk of the particle Such a physical barrier would effectively prevent th running together of liquid particles to form large droplets

If incubation be continued for a further period—viz., u to 14 days—the only further change observed is an increas in the number of spheres and granules.

With regard to the filamentous structures described b Chevassut, these are inconstant and late in appearance When they occur the filaments vary in length from approximately 0·1 μ to 2 μ, and are excessively fine and tenuous They are best seen either in "strongly positive" cultures or in those which are relatively old—i.e., 7 to 14 days The filaments occur in conjunction both with spherule and granules. They are never observed as simple unattache entities. When present, they serve to link together a vary ing number from two to six spheres or granules. Th commonest arrangement is that of a central sphere to whic are attached one or more filaments of varying length wit nules or small spheres at their free ends. Occasionally nents are seen crossing each other transversely, with ll refractile granules at the free extremities of each ment.

till another appearance is not infrequently observed, more often in disseminated sclerosis than in other es of organic disease—viz., a straight, beaded rod-like n about 4μ long and 0·15μ in diameter. This rod ticipates in the general Brownian movement but has no tility of its own.

loid bodies, or appearances suggestive of "budding," ve never been observed by us in uncontaminated cultures. n all cases illuminated by transmitted light the micro-pical field is completely blank. Dark-ground illumina-n is essential to yield the foregoing appearances. No racteristic staining reactions have yet been discovered. tempts to dissolve out the spheres and granules by fat vents have failed, but this failure may possibly be asso-ted with the presence of the adsorbed protein skin und the particles as above suggested.

In our experience the foregoing ultra-microscopical pearances are not produced by incubation of normal rebro-spinal fluids. They occur with great fre-ency in disseminated sclerosis, but they are not thognomonic of the disease, since they are also en in cultures from other organic nervous diseases, seen in the following list :—

Tabes	.. 7 cases.	
Tabo-paralysis	.. 6 ,,	out of 7.
Cerebral tumour	.. 3 ,,	
Cerebral thrombosis	.. 2 ,,	
Cerebral abscess	.. 1 case.	
Subacute combined degeneration	.. 3 cases.	
Amyotrophic lateral sclerosis	.. 1 case.	
Uræmia	.. 1 ,,	out of 3.
Tuberculous meningitis ..	.. 2 cases.	
Parkinson's disease	.. 1 case	out of 2.
Amentia	.. 1 ,,	
Total	..28	

On the other hand, negative cultures were obtained n the following :—

Normal individuals	.. 4 cases.	
Hysteria	.. 5 ,,	
Vertebral scoliosis	.. 1 case.	
Tabo-paralysis	.. 1 ,,	out of 7.
Uræmia	.. 2 cases	out of 3.
Parkinson's disease	.. 1 case	out of 2.
Total ..	..14	

We would also draw attention to the fact that identical spheres and granules can be seen in many other pathological serous fluids—e.g., serous pleural fluid, serous peritoneal fluid, or serum from chancres—and also in serum-broth cultures that have become contaminated with pathological micro-organisms. If, however, the spheres and granules are removed from such serous fluids by filtration, in only very few instances will they reappear on subsequent incubation. Cases in which reappearance does occur are generally those which had originally contained pus, together with their filtrable enzymes which might subsequently effect a breakdown of serum constituents. "Positive" cultures from cases of disseminated sclerosis can be rendered optically clear, naked-eye and microscopically, by filtration, but re-incubation will constantly reproduce the initial characteristic appearances. This process of filtration and re-incubation can be repeated several times in succession, although the development of granules, &c., tends to slow up after continuous repetition. Optically clear fluid obtained by filtration from a "positive" culture will also reproduce a characteristic appearance when subcultured into fresh broth-serum mixture.

SEROLOGICAL OBSERVATIONS AFTER AUTOGENOUS VACCINE TREATMENT.

A. *Cultural Results.*—Bearing in mind the above criteria of a "positive" culture, we have observed that 10 out of our present series of 101 cases of disseminated sclerosis have become negative during courses of vaccine treatment, whilst 26 cases after showing initially a strongly positive result have become faintly positive. By "faintly positive" we mean either a smaller number of spheres and granules or their delayed appearance—i.e., not until five or seven days after starting the culture. With one exception, all the cases which have become culturally negative after treatment have also shown marked clinical improvement. In four cases, cultures after being positive on several successive occasions have gradually become negative, then for a short while positive again, and finally negative. Here again these findings are associated with clinical improvement.

B. *Globulin and Albumin Content.*—The globulin reaction in the cerebro-spinal fluid has been determined by the usual Nonne-Apelt ring precipitation test. In 72 out of our 101 cases a positive result was obtained at the outset, and in 24 of these the reaction after treatment became negative or only very faintly positive. This diminution in globulin reaction was not always strictly parallel to the clinical improvement, since many of our cases which showed the greatest degree of clinical improvement still yielded a definite globulin reaction. The total albumin content was also systematically observed and in all cases was within normal limits, up to 0·02 per cent.

C. *Colloidal Gold Curve.*—There has been a considerable controversy on the subject of the colloidal gold curve in the cerebro-spinal fluid in disseminated sclerosis, chiefly owing to the difficulty experienced in securing a standardised gold-sol preparation. In our series of cases the colloidal gold solution was made up by formaldehyde reduction in an alkaline medium (potassium bicarbonate). It was finally tested for sensitivity by saline solution, and also by the method of Black, Rosenberg, and McBride.[13] Solutions made up independently in two different laboratories, and tested on the same sample of cerebro-spinal fluid, have always yielded identical results. In agreement with Chevassut these show that the degree of precipitation in disseminated sclerosis is greater than that usually described as typical of this condition, complete precipitation in a number of tubes being by no means uncommon. A fairly typical curve when the patient first comes under observation is 334541000. After a course of vaccine treatment it is not uncommon for the gold curve to improve in type. Only rarely (in 8 out of 101 cases) has it become negative. Definite improvement was seen in 35 cases, 11 became more intense, and the remaining 47 were practically unchanged.

D. *Blood Counts.*—In view of a paper published by Goodall and Slater[14] suggesting a relationship between disseminated sclerosis and subacute combined degeneration of the spinal cord, all our patients in this present series had routine blood examinations carried out, including estimation of hæmoglobin, enumeration of red blood corpuscles, also a total and differential leucocyte count. In none of our cases was there any degree of anæmia present, or any deviation from the normal total and relative proportions of white cells.

E. *Liver Function Tests.*—In her original article, Chevassut described certain tests the results of which suggested impairment of liver function in patients suffering from disseminated sclerosis. These tests have been repeated by us. In only one of our 101 cases was the glycuronic acid test negative after the ingestion of 10 gr. of aspirin, and in only five cases was there an excess of indican in the urine. In a

The serum from C. E. H. was obtained six months after infection. A. E. G., although he had received 10 c.cm. of immune serum from C. E. H., four months previously was found when first tested to be devoid of complement-fixing antibodies. A few days after this test had been performed, A. E. G. contracted Rift Valley fever as a result of assisting at the autopsy of a lamb which was suffering from Rift Valley fever. Fourteen days later complement-fixing antibodies were present in the sera. Protective antibodies, capable of neutralising 1000 m.l.d. (minimum lethal doses) of virus, as shown by the action of the serum in protecting mice against infection with the virus, were detected in the serum nine days after infection.

G. M. F. also had an injection of 10 c.cm. of immune serum from C. E. H. When four months later his serum was tested for complement-fixing antibodies it was found to give a positive reaction, although not quite to the same extent as the sera from definite cases. Protective antibodies capable of neutralising 100 m.l.d. of virus were also present. G. M. F. had *not suffered from any symptoms attributable to* Rift Valley fever although he had performed a number of autopsies on infected animals. It is thus possible to acquire complement-fixing antibodies in the absence of any definite infection.

Table I. shows that fixation is specific for Rift Valley fever and does not occur with normal serum, with sera from syphilitics, nor with serum from recovered cases of dengue and yellow fever. Complement-fixing antibodies remain in the blood for at least six months after infection.

Complement Fixation with the Sera of Susceptible Animals.

In Table II. are shown the effects of complement *fixation with the sera of monkeys (M. rhesus)* recovered from the infection three to five months previously.

TABLE II.—*Complement Fixation with Monkey (M. rhesus) Sera.*

Serum.	Concentration of antigen.			Controls.	Serum.	Concentration of antigen.			Controls.
	2 %	1 %	0·5 %			2 %	1 %	0·5 %	
Monkey 6	+	±	–	–	Monkey 12 (*no C.S.I.*)	±	–	–	–
,, 7	+	±	–	–	Control 1	–	–	–	–
,, 8	+	+	–	–	,, 2	–	–	–	–
,, 9	+	+	–	–	,, 3	–	–	–	–
,, 10	+	+	–	–					

No C.S.I. = No clinical symptoms of infection.

No fixation occurred with the sera of normal monkeys; incidentally two of the monkeys included as normal had recovered from yellow fever 18 months previously. It will be noted that monkey 12, which failed to give any clinical evidence of infection, fixed complement less actively than the others.

Complement-fixation tests with sheep have been limited to two animals, an adult ewe, inoculated with a Berkefeld filtrate from the livers of two mice; and a lamb, inoculated with infected sheep blood which had been preserved for five months at 4° C. The lamb showed only a very temporary rise of temperature and no great constitutional disturbance, but the ewe had more definite symptoms with a rectal temperature of 107·8° F. (Findlay, 1932). The results are shown in Table III.

Three months after infection the sheep still fixed complement but negative results were obtained with the lamb's serum. Protective antibodies had also *disappeared from this animal's* serum, though the sheep's serum was still able to neutralise 1000 m.l.d. of virus.

TABLE III.—*Complement Fixation with Sheep Sera.*

Serum.	Concentration of antigen.			Controls.
	2 %	1 %	0·5 %	
Sheep (7 days after infection) ..	±	–	–	–
(14 ,, ,, ,,) ..	+	+	–	–
(3 months ,, ,,) ..	+	+	±	–
Lamb (7 days after infection) ..	±	–	–	–
(14 ,, ,, ,,) ..	±	±	–	–
(3 months ,, ,,) ..	–	–	–	–
Sheep I. control	–	–	–	–
Sheep II. ,, ...	–	–	–	–

In Table IV. are shown the results obtained with the sera of rats and mice. In the case of these animals the complement-fixing antibodies disappear from the sera with considerable rapidity, so that while the most recently recovered animals fix complement, after the lapse of two months from the date of infection complement-fixing antibodies are so reduced as to be no longer detectable by the present test. Mice appear to produce only very small quantities of complement-fixing antibodies. This may be correlated with the fact that recovery from infection does not confer any lasting immunity in rats and mice which can be reinfected four to six weeks after their first infection. On the other hand, it has been found impossible to reinfect monkeys even six months *after a primary infection.*

TABLE IV.—*Complement Fixation with Sera of Rats and Mice.*

Serum.	Concentration of antigen.			Controls.	Serum.	Concentration of antigen.			Controls.
	2 %	1 %	0·5 %			2 %	1 %	0·5 %	
RATS.					MICE.				
Infected—					Infected—				
2 wks.	+	+	–	–	2 days	–	–	–	–
3 ,,	+	+	–	–	1 wk.	±	–	–	–
3 ,,	+	±	–	–	2 wks.	±	–	–	–
2 mths.	–	–	–	–	6 ,,	–	–	–	–
2 ,,	–	–	–	–	2 mths	–	–	–	–
3 ,,	±	–	–	–	Control—				
4 ,,	–	–	–	–	1	–	–	–	–
Control—					2	–	–	–	–
1	–	–	–	–	3	–	–	–	–
2	–	–	–	–	4	–	–	–	–
3	–	–	–	–	5	–	–	–	–
					6	–	–	–	–

No positive complement fixation was obtained with the sera of rabbits, guinea-pigs, hens, pigeons, and canaries, animals which have been found to be resistant to infection with the virus of Rift Valley fever.

The Use of Dried Virus.—In the foregoing experiments the antigen used was prepared from the livers of freshly killed mice or rats. *It is possible,* however, to employ an antigen prepared from mouse livers which have been dried over phosphorus pentoxide.

Mouse 898 was killed on Nov. 20th, 1931, with symptoms of Rift Valley fever; its liver was finely minced and placed in a desiccator over phosphorus pentoxide at a temperature of +4° C. Fifty-six days later the dried tissues were found still to contain virus for 0·5 c.cm. of a 1 in 10 dilution in physiological saline inoculated into each of 4 mice killed 3 mice in 5 days and 1 in 7 days, a slight retardation in the usual time required to kill mice. A 1 in 250 saline extract of this dried mouse liver was then prepared and tested in a parallel series with a similarly prepared extract from the fresh liver of a mouse which had died from Rift Valley fever, allowance being made for the water content he fresh liver. The results are shown in Table V.; both gens were tested against human and monkey sera.

BLE V.—*Complement Fixation with Dried Antigen.*

Serum.	Concentration of antigen.			Controls.
	1%	0·5%	0·25%	
E. H. (Rift Valley fever) ..	+	—	—	—
P. O'C. (dengue fever) ..	—	—	—	—
nkey 9	+	+	—	—
" 11	+	+	—	—
Fresh Mouse Liver.				
E. H.	+	+	+	—
P. O'C.	—	—	—	—
nkey 9	+	+	+	—
" 11	+	+	+	—

The results were therefore rather less satisfactory an with the fresh liver, in conformity with the ndings that the dried liver was rather less rich in rus than fresh liver.

Discussion.

Specific complement fixation may thus be obtained ith the sera of man and animals who have suffered om Rift Valley fever, using as an antigen the vers of mice and rats suffering from the disease. omplement-fixing antibodies are present in the lood of men and monkeys for at least five to six onths after infection, while positive results are lso obtained with sheep three months after infection; no fixation was obtained with yellow fever mmune serum or dengue immune serum. Complement fixation thus offers a practical method for he diagnosis of Rift Valley fever. Complement-fixing antibodies were definitely detectable in the serum of A. E. G. 14 days after infection, and in the sheep and lamb about the same period. Protective antibodies were present in the case of A. E. G. nine days after the beginning of the illness at which time complement-fixing antibodies could not be detected. Protective antibodies were also present in the sera of the sheep and lamb seven to nine days after infection. Although further evidence is required on this point, it seems likely that protective antibodies are demonstrable in the serum at a somewhat earlier date than complement-fixing antibodies. Hudson (1931) has recently made similar observations in five cases of yellow fever in man. It may be noted that in the case of men, monkeys, and sheep the degree of complement fixation is in some measure correlated with the intensity of the clinical response to the infection.

Up to the present attempts to obtain flocculation or agglutination of the virus of Rift Valley fever with immune sera have failed, nor has it been possible to obtain evidence of skin sensitivity to the virus in those immune to the disease by the intradermal injection of killed virus.

CONCLUSIONS.

(1) Specific complement fixation occurs with the sera of men, monkeys, sheep, rats, and mice recovered from Rift Valley fever when an antigen of the livers of rats and mice infected with Rift Valley fever is employed. (2) Complement-fixing antibodies are well developed in the serum 14 days after infection, and persist for at least six months. (3) Complement-fixing antibodies may appear in the serum in the absence of any definite illness as a result of repeated exposures to infection. (4) The degree of complement fixation is in the case of men, sheep, and monkeys roughly proportional to the severity of the clinical symptoms. (5) Mice and rats produce only small quantities of both complement-fixing antibodies and protective antibodies. (6) Dried liver as an antigen gives less satisfactory results than fresh livers of infected animals.

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RIFT VALLEY FEVER.

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AND
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THE object of this note is to supplement the data given by Findlay and Daubney[1] on the susceptibility of various species of animals, more particularly wild rodents, to inoculation with the virus of Rift Valley fever, and to refer briefly to certain suggestions that were made in the course of the discussion[2] on Dr. Findlay's paper read before the Royal Society of Tropical Medicine and Hygiene.

As stated in our first paper[3] on the disease, the virus was considered to be closely related to the viruses of yellow fever and dengue, and the primary object in taking the virus to England was to ascertain whether any cross-immunity existed between these three viruses. The recent investigations of Schueffner, Dinger, and Snijders[4] on the immunological relationship of yellow fever and dengue were prompted by similar considerations. The Dutch workers wondered if the endemicity of dengue might not be the principal cause of the relative freedom of the Dutch East Indies from yellow fever, and we had indulged in a similar speculation with regard to Rift Valley fever and the absence of yellow fever from East Africa. The results of the actual experiments carried out by Dinger and Snijders[5] are hardly conclusive, and will require extension and confirmation, but the general tenor of their findings is that previous infection with yellow fever failed to protect monkeys (*Macacus rhesus*) against a subsequent infection with dengue, whereas a previous dengue infection conferred some degree of protection against a subsequent inoculation with yellow fever virus.

In the experiments arranged at the Wellcome Bureau of Scientific Research one monkey (*M. rhesus*), immune to yellow fever as a result of a previous infection, did not manifest any immunity against the virus of Rift Valley fever, other *rhesus* monkeys previously vaccinated by Mr. E. Hindle, D.Sc., against yellow fever also failed to show any increased resistance to the virus of Rift Valley fever. The converse experiment could not be tried, owing to the restrictions that have been placed upon the use of yellow fever virus in England.

In the same connexion it would be of considerable interest to compare the susceptibility of various species of African and Asiatic monkeys to Rift Valley fever. The only two African monkeys that have so far been inoculated with the virus in Kenya have failed to react, as judged by subinoculations of their blood into susceptible sheep.

POSSIBLE VECTORS.

Rodents.—The demonstration of the high susceptibility of some European rodents at once recalled to

M 2

mind the fact that during the original outbreak in the Rift Valley there had been a considerable mortality, which was referred to plague, among wild rats (*Arvicanthis abyssinicus nairobæ* and *Rattus rattus kijabius*) on the affected farms; and, in fact, on the farm where the most serious losses of sheep from Rift Valley fever were recorded rodents died in such numbers that inoculation with plague vaccine was carried out. Later a search of the records of rat examinations at the Medical Research Laboratory, Nairobi, revealed that no cases of plague had been found in rats forwarded from this area of the Rift Valley during the period of the outbreak.

In order that the susceptibility of field rats might be examined, trapping was undertaken in an area from which Rift Valley fever has not been recorded, experienced natives being very kindly lent for the purpose by Messrs. Symes and Roberts, entomologists, at the Medical Research Laboratory.

In all, 80 *Arvicanthis abyssinicus nairobæ* were inoculated with strains of virus from sheep, from white mice, and in some cases from other arvicanthis. Of 57 arvicanthis inoculated with strains of virus from sheep or mice, 19 died within 20 days of the inoculation, average period 11 days, and 12 at least could be considered positive on the basis of naked-eye lesions and histological findings in the liver. The nature of the infection was further confirmed in a number of cases by subinoculations into mice and sheep, positive results being obtained at intervals from the second to twelfth day after inoculation. After one or more passages through arvicanthis the virus appeared to become considerably exalted for this species.

Mastomys coucha panya, which is a much rarer species in the Rift Valley fever area, appears to be less susceptible. Of 35 individuals inoculated with virus, only six succumbed to the infection.

Only three specimens of *Otomys angoniensis elassodon* have been available for inoculation: all died within five days of inoculation, with rather indefinite lesions. Since it is difficult to keep this species in captivity, it is not possible to draw any conclusion from this result.

Six wild *Rattus rattus kijabius* and one *Leggada bella* all survived inoculation with virus.

At the end of October, 1931, when trapping was commenced in the Rift Valley fever area, it was found that numbers of arvicanthis were dying on the farm where the original outbreak had occurred 15 months previously. Some of the rats that were trapped died in the traps before morning, a most unusual occurrence with this species which is quite tolerant of captivity. The livers were faintly mottled and organ smears usually showed no bacteria. Emulsions in oxalate-carbol-glycerin of the livers of 15 of these dead arvicanthis, and of one *Rhabdomys pumilio* which also died in a trap, were inoculated into lambs, mice, and into other arvicanthis obtained from an area free from Rift Valley fever. The results were uniformly negative, and histological examination of the livers did not reveal any specific lesion.

Ruminants.—With regard to the susceptibility of wild African ruminants we have up to the present only been able to inoculate one African buffalo.

This animal, a male of about seven months, which had been in captivity at the laboratory for six months, was inoculated with virus from a kid. He gave a marked temperature reaction with dullness and anorexia, and showed some stiffness of the limbs, recovering by the eleventh day.

Helminths.—Reference might be made to the species of tæniorhynchus that have been collected in the Rift Valley fever area.

Through a clerical error the name of species which was suspected as being a vector of the virus was previously given as *T. brevipalpis* instead of *T. fuscopennatus*. During the last season three species of this group (*Mansonia*) have been collected in the area and efforts are being made to establish transmission with all of them.

Arthropods.—In connexion with our suggestion that the virus is adapted for transmission by an arthropod vector, it may be of interest to relate that it has been proved to survive for a period of seven days in engorged nymphæ of *Rhipicephalus appendiculatus* that had been infected by feeding on a reacting sheep. Twenty-four days later, when the nymphæ had moulted to the adult stage, they failed to transmit the virus on inoculation into a susceptible sheep, nor did the other adults of the same batch transmit when allowed to feed on a susceptible animal.

CLINICAL CHARACTERISTICS.

In a personal communication Mr. R. E. Montgomery has asked us to search the laboratory records and, if possible, to trace the course of the investigations into a disease of young lambs to which he referred in the discussion of Dr. Findlay's recent paper on Rift Valley fever. Although no records of these investigations can be found, the lesions he describes—namely, the presence of discrete hæmorrhagic points in the parenchyma of the organ, leading to the development of necrotic centres as large as a threepenny piece, together with suppurative processes in the umbilical region—are not consistent with a diagnosis of Rift Valley fever.

The protocols of a second series of experiments with a mild febrile disease of cattle to which he also makes reference, had already been consulted before we wrote our original paper. The records, which consist of temperature charts and post-mortem sheets, indicate that he was dealing with an inoculable disease of domesticated ruminants with an incubation period of from 7 to 14 days, of which the agent did not pass Berkefeld or Chamberland filters in carefully controlled experiments. This disease does not appear to be either Rift Valley fever, three-day sickness, or heartwater.

As stated in our original paper [3] we have been able to obtain a history of earlier outbreaks of Rift Valley fever in lambs and adult sheep, in cattle, and in man. It is possible, and even probable, that Mr. Montgomery, in common with other veterinarians and medical men, saw cases of the disease, but was not favoured with the combination of circumstances which in 1930 enabled us to connect the disease in sheep with the much milder manifestations in bovines and in man.

Attention has also recently been drawn to clinical and pathological similarities between Rift Valley fever and three-day sickness of cattle.

We have already stated elsewhere [3] that there are available valuable records of inoculations of cattle and sheep with the virus of three-day sickness performed by Montgomery, in which it is shown that the incubation period of three-day sickness in cattle is from five to eight days and that the febrile reaction is invariably accompanied by some degree of lameness which may be so severe that the animals are unable to rise for some days. This is in complete agreement with the clinical picture of the disease as it occurs naturally. Moreover, Montgomery was unable to provoke reactions in any of 23 sheep inoculated with blood containing the virus. Bevan [6] obtained mild temperature reactions commencing from six to ten days after inoculation, in three sheep inoculated with the blood of cattle suffering from three-day sickness. No stiffness or lameness was observed and unfortunately no subinoculations were made into cattle to confirm the nature of the reaction. In his account of post-mortem findings in cattle dead of the disease he states that the liver, kidneys, and spleen showed no lesions, whereas our observations show that in fatal cases of Rift Valley fever in cattle, whether naturally contracted or experimentally induced, there is an unmistakably typical lesion of the liver. Further, although some stiffness of the limbs was shown by the infected buffalo mentioned earlier in the text, no lameness or stiffness of the limbs has been detected in any of the affected bovines that have been under observation.

While three-day sickness of cattle in all probability is a member of the same group of virus diseases, there is hardly room for doubt that it is quite distinct from Rift Valley fever.

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CLINICAL AND LABORATORY NOTES

A CASE OF COMBINED DEGENERATION OF THE CORD TREATED WITH MASSIVE DOSAGE OF IRON.

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A WOMAN, aged 45, had been suffering from mptoms of pernicious anæmia since April, 1929. le had the typical lemon-yellow pigmentation, eakness, and dyspnœa, with an erythrocyte count 2,800,000 per c.mm., and hæmoglobin 70 per cent. le recovered after the administration of liver tract, but suffered two relapses owing to her having ased to take the liver. In September, 1931, her ythrocyte count had again fallen to 2,000,000, d her average pulse-rate while resting was 120. d she had slight œdema of the legs. At no time is there any glossitis.

After six weeks' liver treatment her erythrocyte unt reached 3,475,000, with 72 per cent. hæmoglobin d 7800 white cells, and after another six weeks was 4,350,000 per c.mm., 79 per cent. hæmoglobin, it the average size of the red cells was not increased. owever, she did not show a gain of strength commensurate with the improvement in the blood picture, d in November, 1931, profuse slumber sweats broke t over the chest, followed by tingling in the fingers the right hand and difficulty in walking. Within fortnight the characteristic glove and stocking æsthesia and ataxic gait of subacute combined generation of the cord were present.

There was sensory loss to light touch and pain extending the right arm to the elbow and in the left arm to the ist, and extending on to the trunk on the right upper orax. There was also sensory loss on the right leg to the lf and on the left leg to the ankle, also loss of vibration ase in both legs. There was intense pain on pressure in right upper arm. Astereognosis was complete in both nds, and loss of kinæsthetic sense in both arms and legs l to complete incoördination of movements. The kneeks were exaggerated on both sides, the plantar reflex was xor on the left, and ? extensor on the right. The abdonal reflexes were obtained with difficulty. The patient uld not walk without holding on for support, and then ly with an unsteady, spastic gait. Rombergism was so arked that she collapsed on to the floor on shutting her es. The sphincters were not affected. There was some iscular wasting of the arm and leg muscles, but power is fairly good except in the right arm, although the tient had been in bed for the anæmia for three months fore the onset of the disease. There were no trophic anges, but a bluish pigmentation of the skin of the lower domen was noticed. Cranial nerves were normal, but ere was a slight degree of verbal aphasia.

Treatment with intravenous arsenic had to be andoned owing to intolerance, and substitution of w liver for the extract effected little change in er condition after a month. At the beginning of ebruary, 1932, she was put on grs. 150 iron (as land's pill) daily,[1] and ¼ lb. raw liver twice weekly.

After two weeks sensation had returned in the left arm id in all but the fingers of the right arm. She could write, hich ability she had completely lost. Astereognosis and coördination in the hands disappeared, the pain was lieved, but the cold feeling persisted. The gait was still ery unsatisfactory, and Rombergism was present. At the eginning of the fourth week of treatment the patient ained control of her leg movements almost suddenly, and an now walk without support and even toe to heel. ombergism has disappeared.

The only signs of subacute combined degeneration now persisting are the slumber sweats, some anæsthesia of the terminal phalanges of three digits, and deficient vibration sense in the left leg. Meanwhile the erythrocyte count has fallen to 3,400,000 and the colour-index risen to 1·3; so the liver has been increased to ½ lb. daily.

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[1] See Treatment of Subacute Combined Degeneration of the ord by Massive Iron Dosage, by W. Sargant, THE LANCET, an. 30th, p. 230.

A CASE OF UNDULANT FEVER

SIMULATING SUBACUTE CHOLECYSTITIS.

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CASES of undulant fever still continue to attract the attention of increasing numbers of clinicians, and the latest extensive survey[1] of the varied manifestations of the disease suggests that these are protean. In this report by Hardy and his colleagues of 375 cases which occurred in the single State of Iowa, mention is made of the different diagnoses proffered before the actual cause of the conditions was discovered. Among the erroneous diagnoses were typhoid fever, influenza, tuberculosis, cardiovascular conditions, diseases of the genito-urinary system, and abdominal disorders. It is stated that Simpson[1 2] had a record of twelve appendicectomies and two cholecystectomies performed on cases of undulant fever.

The interest of the case under discussion lies in the full and intelligent description which the patient was able to give of her symptoms, and also in the fact that, in the hunt for the cause of the disease, the gall-bladder seemed to be the most likely focus of infection and a surgeon was called in for his opinion on the advisability of operation.

REPORT OF CASE.

The patient was a farmer's wife aged 30 years, who had had two children, the first, three years ago and the second, one year ago. She consulted me at my rooms at the end of January, 1931. Apologetically, she complained that she had a collection of minor ailments, no one of which in itself was enough to make her seek medical aid.

She had contracted a ringworm on the left forearm two or three weeks before Christmas which had healed, but which had recurred on the outbreak of a cold. Associated with the cold, a dry barking cough had developed about New Year's Day and had brought on vomiting. She further complained of anorexia, and of sweats in the morning from 3 to 6 A.M., which made her far too uncomfortable to sleep. She had noticed that on Christmas Day she had "felt off form and unable to eat her plum-pudding." By New Year's Day she was having "shivering fits" after midday dinner and attacks of goose-flesh, which would continue for the rest of the day if she left the fire, though not if she kept busy at her housework. The shivering attacks would last about half an hour, and as they passed off she began to feel hotter.

Her temperature on the first day of examination was 101° F. and her pulse-rate 96. She was accordingly sent to bed, and very soon her cough disappeared, though she developed a sore-throat. The fauces were a little inflamed, though not enough to account for the temperature. She continued to have occasional rigors about 2 to 3 A.M., and the association with cutis anserina and digestive disturbances —such as wind, occasional vomiting, feelings of vague abdominal discomfort, aching pains in the back, along with very definite tenderness and hyperæsthesia over the gall-bladder and to a lesser extent around McBurney's point—suggested the possibility of a subacute cholecystitis. The opinion of a surgeon was accordingly sought; while unable to give an alternative diagnosis, he thought that, in the absence of acute pain and greater constitutional disturbance, operation was not advisable. In the light of subsequent events, one must assume that the tenderness was due to a mild inflammatory reaction set up by the presence of organisms in the gall-bladder, as this is one of the places in which the organisms flourish.

Further questioning gave very little help, though there had been diarrhœa, about one day a week, without alternating constipation. The motions had been light brown in colour and rather offensive. The heavy sweats had been rather offensive and strong in odour at the beginning of the illness, though not latterly. Before the patient came to bed the tongue had been dirty grey colour and there had been a bad taste in the mouth and foul breath, though at the time of the first examination nothing abnormal was noted. There had been frontal headaches, especially on awakening in the morning, for some weeks previously. On the whole, sleep was not much disturbed, though she had a tendency to sleep lightly and to awaken early in the morning. Menses were normal.

Rash.—About the beginning of February the patient had noticed on the backs of the hands colourless raised-up spots; these lasted two or three days and then disappeared. They did not cause itching.

Beyond an occasional trace of albumin, no abnormalities were detected in the *urine*. There were a few scattered râles in the *chest*, but no other indications of morbidity.

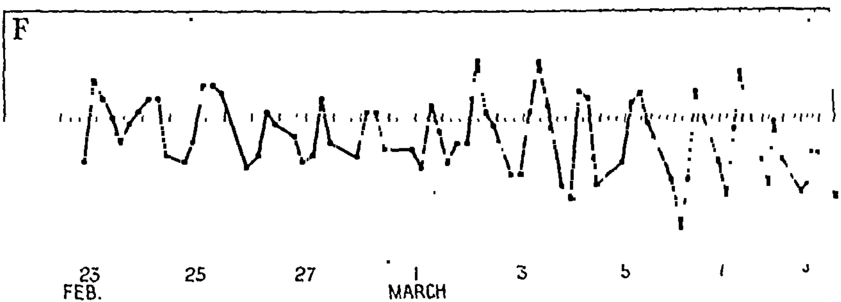
The *spleen* was felt to be soft and was tender to the touch. Although it was definitely enlarged, deliberate examination had to be carried out to detect the enlargement.

Blood.—On Feb. 25th a white blood count showed 8000 cells per c.mm. No differential count was made.

On Feb. 26th a bacteriological report on the blood showed negative agglutination to the enteric group. Agglutination to *Bacillus abortus* Bang was obtained in a titre of 1 in 1280 at 55° C. after 18 hours. The organisms were not isolated from urine or blood, and unfortunately, owing to the difficulties of distance, I was unable to get a further specimen of blood for direct inoculation at the height of the fever.

Temperature.—The chief point of interest in the four-hourly temperature chart (Fig. 1) is the daily maximal temperature appearing round about 2 P.M. in the early part of the illness, but at about 6 P.M. as the illness developed. This feature is mentioned in the Ministry of Health Report by Dalrymple-Champneys,[3] who states that in Mediterranean fever "the fever is usually of the remittent type, the rise beginning (according to Hughes) about 11 A.M., attaining its maximum between 2 and 3 P.M. and then falling, reaching normal about 10 P.M. or 11 P.M. or later, the fall being accompanied by profuse perspiration." It will be seen from the chart (Fig. 1) that, generally speaking, in the present case the temperature did not attain its minimum until 6 to 10 A.M. The total duration of the fever (Fig. 2) was probably about 90 days, though an occasional elevation of temperature was noted in the evening after the expiry of that length of time.

FIG. 1.



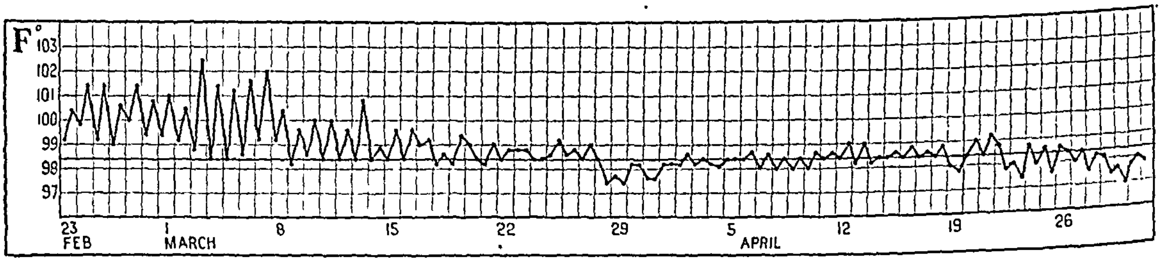
Part of four-hourly temperature chart, showing time of day when temperature was highest.

The pulse-rate varied between 80 and 100 in the initial stages of the illness.

Course of Illness.—On March 13th the patient complained for the first time of joint pains. The left shoulder began to ache during the day, and this led to difficulty in moving. The pains also affected the elbow. A few red spots appeared on the abdomen, situated about two inches from each other. They were very itchy and not raised up. On March 20th a rash broke out on the foot. The feet and hands itched and burned all through the night. The rash spread up the front of the leg and up both buttocks, and appeared on the back of the right arm and elbow and on the neck below the mandible. It was evident on the soles of the feet, the palms of the hands, and between the fingers. Around the joints it came as big red blotches, while in other places it consisted of reddish spots, about the size of a lentil, more like the rash of rubella than anything else. The spots were slightly raised, and disappeared on pressure.

On March 22nd the rash completely covered the whole body, and on the following day it began to fade from the places first affected. It was almost gone two days later, except for the flexures of the elbows. On March 30th the spleen was just palpable. The patient was now getting up. On April 13th the spleen was neither palpable nor tender.

FIG. 2.



Morning and evening temperature chart.

ORIGIN OF INFECTION.

On inquiring from the farmer (the patient's husband) I learned that there had been an epidemic contagious abortion among five of the cattle. : first cow “ picked its calf ” (to use the farmer’s ression) in September, seven weeks before it ; due to calve. The calf was dead, but the veterinary geon inoculated the cow, which the farmer retained. : second one was delivered about the middle of ember, and the calf survived. The cow was ked for a fortnight and then sold. As the patient ; in the habit of drinking fairly large quantities nilk, it seems most likely that this cow was the rce of infection, as the symptoms were first noted Christmas Day; this fits in with the incubation iod of six to twenty days (Bassett-Smith [4]). The er cows aborted after the onset of the patient’s ess. According to Dalrymple-Champneys [5] the jority of actual abortions occur between the fifth seventh months of pregnancy, though quite n it is not noticed, as the animal’s general health isually quite unaffected. The farmer stated that condition showed itself in his cows by the urrence of premature labour with a tendency the placenta to be retained; this was likely to be owed by a discharge for 14 to 21 days (instead of) 14), offensive and dirty yellowish-looking, associated with a diminution or complete absence of ation.

SUMMARY.

his case was characterised by: (1) An irregular exia attaining its daily maximum height at about .M., associated with a pulse-rate not elevated in portion to the fever and accompanied by rigors. Constitutional disturbance far less severe than ld be expected from the height of the fever. Definite tenderness over the gall-bladder area, to a lesser extent in the right iliac fossa. Definite splenic enlargement and tenderness. Definite history of contagious abortion in cattle the farm. (6) Report of agglutination in titres up 1 in 1280 dilution against *B. abortus* Bang at C. (7) Indefinite symptoms and signs referable the respiratory tract. (8) Delayed appearance of it pains and, except for a fleeting eruption towards beginning of the second month of the illness, rked delay in the appearance of a rash.

wish to express my indebtedness to the director staff of the Public Health Laboratory, Manchester, carrying out the agglutination reactions.

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NDER RIB-CARTILAGE AS A SIGN OF CHOLECYSTITIS.

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CHOLECYSTITIS is stated by Hurst [1] to be the mmonest of all chronic abdominal disorders; it is rtainly common in New Zealand, and I recently alysed 100 cases admitted within two years to a spital of 300 beds.

Some years ago, in examining a case of it my ger-tips accidentally came into abrupt contact with e patient’s rib-cartilage bounding the right hypo- ondrium, which induced a sharp flinch of pain, and on closer examination I found a tender spot upon the eighth right costal cartilage, on its lower edge (not its anterior surface), which could have been found by approaching the patient from behind and hooking one’s right-hand fingers round the costal margin.

Since then I have sought for it in every abdomen that I have examined, and I have found it repeatedly in cases of cholecystitis, with or without gall-stones; of course, the great majority of such cases have gall-stones. The sign is sought for with the hand flat on the upper abdomen; the third finger-tip is brought into firm contact with the costal margin, inch by inch along its whole length from without inwards, beginning on the left side, saying nothing and watching the patient’s face. Occasionally in cases of gastric ulcer there is a similar but slighter area of tenderness on the left rib margin, but it is inconstant. On the right, in a case of cholecystitis, a single tender spot, indicated by the patient’s expression, is found, generally on the eighth rib edge, sometimes a little higher or lower, and just covered by the finger-tip. Occasionally, but by no means always, the skin of the whole eighth dorsal segment on the same side is hyperalgesic to pin-prick. I believe this tender spot to be quite as dependable in the diagnosis of cholecystitis as is McBurney’s point in appendicitis.

In some cases of cholecystitis it is continually present, in others it comes and goes, but is usually to be found when any degree of colic is in progress and for some days after, even in persons who do not always show it. It is not invariably present; it is not a sine qua non of cholecystitis; I have failed to find it in a few cases with a positive Graham’s test, in which gall-stones were present at operation.

In a series of 20 cases, analysed for another paper, the following results were obtained :—

		Tenderness.	No tenderness.
Previously operated upon for cholecystitis	5	5	—
No operation, symptoms of cholecystitis	4	3	1
Cholecystitis and gall-stones at operation	6	6	—
Cholecystitis, *no stones at operation* ..	5	4	1

I do not find that writers on the gall-bladder describe this sign: Graham, Cole, Copher, and Moore [2] mention “a manœuvre first described by J. B. Murphy, a sudden jab of the fingers under the right costal margin just as the patient has completed a deep inspiration . . . will elicit tenderness.” This, I take it, is meant to exert pressure on the gall-bladder, but no “sudden jab” is required on the cartilage. Hurst and Stewart [3] state under “differential diagnosis” that “tenderness of the gall-bladder is increased or only present when a deep inspiration carries the gall-bladder sufficiently far below the costal margin to bring it into contact with the fingers,” which is probably seeking for Murphy’s sign. Walton [4] states that “occasionally there may be slight tenderness in the epigastrium or over the gall-bladder.” Griffiths [5] writes of “tenderness below the tip of the ninth right costal cartilage,” and Rolleston and McNee [6] write of “tenderness over the upper right quadrant of the abdomen which becomes more localised and more intense at the so-called biliary point below the tip of the ninth costal cartilage. Cutaneous hyperæsthesia may be present in the eighth and ninth dorsal segments.” I can, however, find no account of tenderness of the costal margin, of the existence of which I have none the less convinced various sceptical colleagues.

The precise significance, the mechanism of the over the gall-bladder and to a lesser extent around McBurney's point—suggested the possibility of a subacute cholecystitis. The opinion of a surgeon was accordingly sought; while unable to give an alternative diagnosis, he thought that, in the absence of acute pain and greater constitutional disturbance, operation was not advisable. In the light of subsequent events, one must assume that the tenderness was due to a mild inflammatory reaction set up by the presence of organisms in the gall-bladder, as this is one of the places in which the organisms flourish.

Further questioning gave very little help, though there had been diarrhœa, about one day a week, without alternating constipation. The motions had been light brown in colour and rather offensive. The heavy sweats had been rather offensive and strong in odour at the beginning of the illness, though not latterly. Before the patient came to bed the tongue had been dirty grey colour and there had been a bad taste in the mouth and foul breath, though at the time of the first examination nothing abnormal was noted. There had been frontal headaches, especially on awakening in the morning, for some weeks previously. On the whole, sleep was not much disturbed, though she had a tendency to sleep lightly and to awaken early in the morning. Menses were normal.

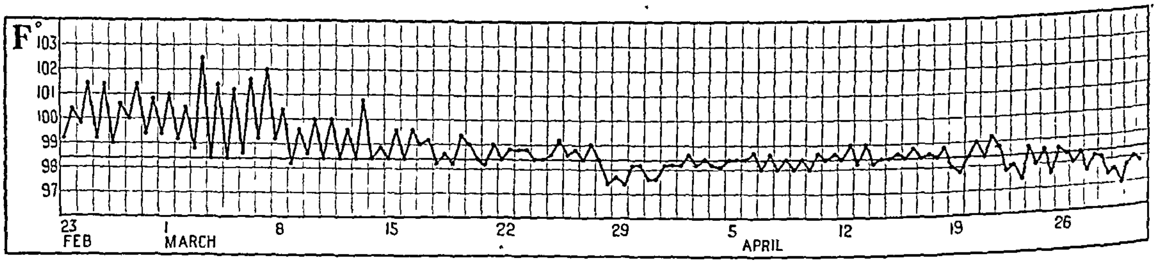
Rash.—About the beginning of February the patient had noticed on the backs of the hands colourless raised-up spots; these lasted two or three days and then disappeared. They did not cause itching.

Beyond an occasional trace of albumin, no abnormalities were detected in the *urine*. There were a few scattered râles in the *chest*, but no other indications of morbidity.

The *spleen* was felt to be soft and was tender to the touch. Although it was definitely enlarged, deliberate examination had to be carried out to detect the enlargement.

Blood.—On Feb. 25th a white blood count showed 8000 cells per c.mm. No differential count was made.

FIG. 2.

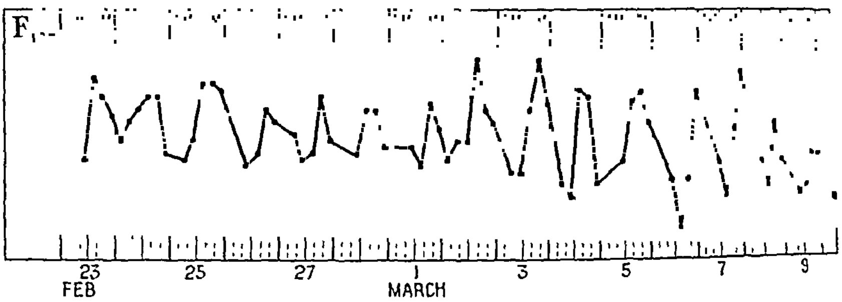


Morning and evening temperature chart.

On Feb. 26th a bacteriological report on the blood showed negative agglutination to the enteric group. Agglutination to *Bacillus abortus* Bang was obtained in a titre of 1 in 1280 at 55° C. after 18 hours. The organisms were not isolated from urine or blood, and unfortunately, owing to the difficulties of distance, I was unable to get a further specimen of blood for direct inoculation at the height of the fever.

Temperature.—The chief point of interest in the four-hourly temperature chart (Fig. 1) is the daily maximal temperature appearing round about 2 P.M. in the early part of the illness, but at about 6 P.M. as the illness developed. This feature is mentioned in the Ministry of Health Report by Dalrymple-Champneys,[3] who states that in Mediterranean fever "the fever is usually of the remittent type, the rise beginning (according to Hughes) about 11 A.M., attaining its maximum between 2 and 3 P.M. and then falling, reaching normal about 10 P.M. or 11 P.M. or later, the fall being accompanied by profuse perspiration." It will be seen from the chart (Fig. 1) that, generally speaking, in the present case the temperature did not attain its minimum until 6 to 10 A.M. The total duration of the fever (Fig. 2) was probably about 90 days, though an occasional elevation of temperature was noted in the evening after the expiry of that length of time.

FIG. 1.



Part of four-hourly temperature chart, showing time of day when temperature was highest.

The pulse-rate varied between 80 and 100 in the initial stages of the illness.

Course of Illness.—On March 13th the patient complained for the first time of joint pains. The left shoulder began to ache during the day, and this led to difficulty in moving. The pains also affected the elbow. A few red spots appeared on the abdomen, situated about two inches from each other. They were very itchy and not raised up. On March 20th a rash broke out on the foot. The feet and hands itched and burned all through the night. The rash spread up the front of the leg and up both buttocks, and appeared on the back of the right arm and elbow and on the neck below the mandible. It was evident on the soles of the feet, the palms of the hands, and between the fingers. Around the joints it came as big red blotches, while in other places it consisted of reddish spots, about the size of a lentil, more like the rash of rubella than anything else. The spots were slightly raised, and disappeared on pressure.

On March 22nd the rash completely covered the whole body, and on the following day it began to fade from the places first affected. It was almost gone two days later, except for the flexures of the elbows. On March 30th the spleen was just palpable. The patient was now getting up. On April 13th the spleen was neither palpable nor tender.

ORIGIN OF INFECTION.

On inquiring from the farmer (the patient's husband) I learned that there had been an epidemic contagious abortion among five of the cattle. first cow "picked its calf" (to use the farmer's ression) in September, seven weeks before it due to calve. The calf was dead, but the veterinary geon inoculated the cow, which the farmer retained. second one was delivered about the middle of ember, and the calf survived. The cow was ked for a fortnight and then sold. As the patient in the habit of drinking fairly large quantities milk, it seems most likely that this cow was the rce of infection, as the symptoms were first noted Christmas Day; this fits in with the incubation iod of six to twenty days (Bassett-Smith[4]). The er cows aborted after the onset of the patient's ess. According to Dalrymple-Champneys[5] the jority of actual abortions occur between the fifth seventh months of pregnancy, though quite en it is not noticed, as the animal's general health usually quite unaffected. The farmer stated that condition showed itself in his cows by the urrence of premature labour with a tendency the placenta to be retained; this was likely to be lowed by a discharge for 14 to 21 days (instead of o 14), offensive and dirty yellowish-looking, associated with a diminution or complete absence of tation.

SUMMARY.

This case was characterised by: (1) An irregular rexia attaining its daily maximum height at about P.M., associated with a pulse-rate not elevated in oportion to the fever and accompanied by rigors.) Constitutional disturbance far less severe than ould be expected from the height of the fever.) Definite tenderness over the gall-bladder area, d to a lesser extent in the right iliac fossa.) Definite splenic enlargement and tenderness.) Definite history of contagious abortion in cattle the farm. (6) Report of agglutination in titres up 1 in 1280 dilution against *B. abortus* Bang at 5° C. (7) Indefinite symptoms and signs referable the respiratory tract. (8) Delayed appearance of oint pains and, except for a fleeting eruption towards he beginning of the second month of the illness, narked delay in the appearance of a rash.

I wish to express my indebtedness to the director nd staff of the Public Health Laboratory, Manchester, or carrying out the agglutination reactions.

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TENDER RIB-CARTILAGE AS A SIGN OF CHOLECYSTITIS.

By D. W. Carmalt-Jones, D.M. Oxf., F.R.C.P. Lond.,

PROFESSOR OF SYSTEMATIC MEDICINE IN THE UNIVERSITY OF OTAGO, N.Z., AND PHYSICIAN TO THE DUNEDIN HOSPITAL.

Cholecystitis is stated by Hurst[1] to be the commonest of all chronic abdominal disorders; it is certainly common in New Zealand, and I recently analysed 100 cases admitted within two years to a hospital of 300 beds.

Some years ago, in examining a case of it my finger-tips accidentally came into abrupt contact with the patient's rib-cartilage bounding the right hypochondrium, which induced a sharp flinch of pain, and on closer examination I found a tender spot upon the eighth right costal cartilage, on its lower edge (not its anterior surface), which could have been found by approaching the patient from behind and hooking one's right-hand fingers round the costal margin.

Since then I have sought for it in every abdomen that I have examined, and I have found it repeatedly in cases of cholecystitis, with or without gall-stones; of course, the great majority of such cases have gall-stones. The sign is sought for with the hand flat on the upper abdomen; the third finger-tip is brought into firm contact with the costal margin. inch by inch along its whole length from without inwards, beginning on the left side, saying nothing and watching the patient's face. Occasionally in cases of gastric ulcer there is a similar but slighter area of tenderness on the left rib margin, but it is inconstant. On the right, in a case of cholecystitis, a single tender spot, indicated by the patient's expression, is found, generally on the eighth rib edge, sometimes a little higher or lower, and just covered by the finger-tip. Occasionally, but by no means always, the skin of the whole eighth dorsal segment on the same side is hyperalgesic to pin-prick. I believe this tender spot to be quite as dependable in the diagnosis of cholecystitis as is McBurney's point in appendicitis.

In some cases of cholecystitis it is continually present, in others it comes and goes, but is usually to be found when any degree of colic is in progress and for some days after, even in persons who do not always show it. It is not invariably present; it is not a sine qua non of cholecystitis; I have failed to find it in a few cases with a positive Graham's test, in which gall-stones were present at operation.

In a series of 20 cases, analysed for another paper, the following results were obtained:—

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The precise significance, the mechanism of the tenderness, is a matter upon which one who is only a clinical observer can but speculate. I have to confess that I have had a few cases of apparently typical biliary colic, with a tender cartilage, which came to operation and that then a normal gall-bladder was found.

The gall-bladder is a hollow viscus, and like the other hollow viscera pain arising from it is caused only by some increase of tension within it. It is presumably insensitive to trauma, and hepatic colic is not due to the scratching of a sensitive surface by a gall-stone, but to spasmodic and ineffectual contraction of the viscus, caused, it may be, by an incoördination between the fundus and the sphincter of Oddi through disturbance of the harmonious coöperation of the vagus and sympathetic.

Bain [7] states that the nerve-supply of the gall-bladder consists of the vagus and of fibres from the sympathetic, 6 D to 1 L. Experimentally, slight stimulation of the vagus causes the fundus to contract and the sphincter of Oddi to relax, and this may be assumed to be what occurs when the gall-bladder empties in health. But under strong stimulation of the vagus both fundus and sphincter go into spasm, so that the contraction of the fundus is ineffectual—the condition which induces visceral pain. It may be that biliary colic depends on such stimulus of the vagus. I would suggest that spasm of the sphincter of Oddi, which is believed to be controlled by the sympathetic, induces this tender spot on the body wall, and sometimes hyperalgesia of a whole segment in the area of [illegible] ic innervation. The cases found [illegible] may be due to reflex spasm induced by a focus of irritation elsewhere, or to another cause; spasm of the gall-bladder may possibly be an allergic manifestation.

Graham and his colleagues [8] remark that intestinal allergy is probably rather frequently confused with cholecystitis, but this has received "almost no mention."[2] I believe that some of the negative cases are due to intestinal allergy; this question I am discussing in another paper.

I believe, however, that tenderness of the right costal margin, in the neighbourhood of the eighth costal cartilage, is a valuable sign of disturbed function of the gall-bladder, which is in most cases due to cholecystitis and gall-stones.

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MEDICAL SOCIETIES

ROYAL SOCIETY OF MEDICINE.

COMBINED SECTIONS OF UROLOGY AND OBSTETRICS.

AT a combined meeting of these sections on March 10th, Mr. R. OGIER WARD, the President of the Section of Urology, being in the chair, the subject of discussion was

Frequency of Micturition in Women.

Mr. G. E. NELIGAN said mostly the cause of the frequency was easy to diagnose and the treatment was well established, though in some cases the outlook from the start was hopeless. He enumerated the causes of over-secretion of the kidneys, which might occur: (1) in the later stages of chronic nephritis, when it was due either to acute nephritis of primary character or to hyperpiesis—the history, physical signs, and the presence of albumin and casts in the urine supplied the clue; (2) in the presence of congenital cystic kidneys, where a palpable tumour might be felt and pyelography would aid diagnosis; (3) in diabetes mellitus; (4) in renal calculus, where the history and X rays gave the diagnosis; (5) in renal tuberculosis, pyelocystitis, and pyelonephritis; and (6) in functional polyuria. After mentioning briefly causes arising in the bladder itself, such as calculi, foreign bodies, and carcinoma, and causes of frequency outside the bladder, including pressure of the pregnant uterus, or pelvic tumours, as fibroids or ovarian cysts, Mr. Neligan spoke in more detail on pyelonephritis and functional polyuria.

Pyelocystitis and pyelonephritis.—Usually these cases were readily diagnosed, and readily responded to treatment. It was still not sufficiently recognised that frequent and large doses of alkalis should be given, and that it was not advisable to stop giving potassium citrate as soon as symptoms and temperature subsided. He himself prescribed pot. cit. ʒ i. two-hourly until the urine was alkaline, and then gave the drug in sufficient doses to keep the urine alkaline for a fortnight. The difficult cases were the mild ones, symptoms being confined to frequency and pain on micturition. Basal cystitis was usually present and frequently both kidneys were infected. Every patient who had persistent cystitis should have the urine from each kidney cultured, should be examined radiographically and have a pyelogram taken, so as to exclude such complications as calculi. The bladder condition could not be cleared up until the kidneys were well. Patients with pyelocystitis should be impressed with the fact that the three cardinal sins of life were catching cold, drinking too little fluid, and allowing constipation to become established. This applied especially to women who feared that copious drinking of water would make them fat. Diet also was important; often these women lived on slops and were half-starved.

Functional polyuria.—Patients with functional polyuria usually complained of great frequency during the day, but slept peacefully through the night. Their attention was fixed on their bladders and hence their social activities were restricted; a railway journey, however short, in a carriage without a lavatory became an agony. Yet they could take a long motor journey without inconvenience if their minds were occupied with a subject of interest. Mr. Neligan felt sure the problem was one of nervous over-secretion of the kidney, because each time these patients urinated they passed a good quantity. Both sexes suffered from it in times of unusual emotional stress, such as during an examination, or when under heavy fire in warfare. In chronic cases the polyuria still continued when the stress was over. In women who had taken sexual risks and were suffering from gonophobic polyuria ceased when they were reassured on this point. Treatment of functional polyuria was difficult and often hopeless. The main requirement was to give an exhaustive mination in order to be able to assure the patient the absence of organic disease. Many patients e impressed if it was explained to them that the ney over-secretion was due to worry.

Ir. **Victor Bonney** said that frequency might (1) due to disease or abnormality of the urinary ct or of the genital organs, or of neighbouring struc- es; or (2) of purely nervous origin. The last group ild be further divided into those associated with excessive production of urine, and those lacking h excessive production. In the first of these groups hing was wrong with the bladder, the frequency ng merely the result of the excessive kidney retion. In the second group the nervous chanism was at fault. It could be taken as a rule it frequency which woke the patient at night d compelled evacuation had a physical basis, ile if sleep was uninterrupted the case was probably e to functional disturbance. The next main tegory was of cases in which the frequency was e to vagino-vesical displacement. One of the most mmon forms of urinary trouble in women was that which Mr. Comyns Berkeley and himself had awn attention and which had been termed "stress continence" by Mr. Eardley Holland. It occurred women who had borne children, but was not erative until a number of years after the birth. was a mistake to attribute it to cystocele. These omen voided a sudden jet of urine on coughing or eezing, or on performing any other sudden act. true cystocele consisted of a hammocking of the ginal wall accompanied by a pouch in the base of ie bladder, and in excessive degrees it might be ecessary for the patient to push the cystocele up ith her finger before the bladder would act. Stress continence was accompanied by a descent of the wer end of the vagina away from its attachment the subpubic angle, and this involved also the lock of tissue in which the urethra ran and which he speaker had termed the peri-urethral wedge. n the female there was no collection of fibres at the ladder neck which could be called a true sphincter. Instead there was a sphincteric mechanism as he had pointed out in a previous paper. A pessary in these cases was useless. They could be cured by an operation which tautened the sphincteric mechanism. In a few cases ventrofixation of the bladder might be needed. In stress incontinence the escape of urine was quite involuntary, and was not preceded by the urge to micturate, but in what he termed "precipitate micturition" and "urge incontinence" the desire to micturate was so sudden and violent that unless the patient could instantly relieve herself incontinence occurred. The urine in these cases showed no changes pointing to bladder inflammation, and the cystoscope showed no more, in the speaker's experience, than a slight blush at the base of the bladder. The condition was evidently due to a hypersensitisation of sensory nerve-endings or perhaps some vasomotor instability of the vessels in that region. In conclusion, Mr. Bonney spoke of frequency due to urethral carunculosis. For this condition when intractably recurrent he had obtained relief by lengthening the urethra by an operation, the technique of which he described.

Miss **G. M. Sandes** said that a comprehensive view of the occurrence of frequency of micturition in women would not be obtained until women had been educated to recognise that frequency was not normal, and should be reported to a doctor. When frequency occurred in patients suffering from venereal diseases it was usually associated with pain; it was very common at the onset of gonorrhœa. Some patients suffered from frequency before discharge occurred. Of hospital gonorrhœa patients she found that 85 per cent.—chiefly girls of 16 to 25 years—had frequency with pain. A young girl might not show diminished frequency until after many weeks in hospital. In older women acute urethritis either cleared up fairly rapidly or became chronic. Many women thought it was the common lot to have a vaginal discharge, and this belief accounted for the fact that many cases of gonorrhœa were not diagnosed until salpingitis supervened. A non-gonorrhœal form of urethritis usually proved very intractable; here frequency was apt to be continuous. On culturing the urine, diphtheroids were grown. Massive doses of alkali and weekly instillation of glycerin was the treatment indicated. The condition was found commonly in dancers and gymnasts. Gumma of the bladder caused frequency, and it was a marked symptom in tabetic women. If it was untreated, overflow incontinence resulted. One group of cases with frequency included those who had had an operation for prolapse of the uterus; the calls could not be said to be due to a nervous condition. Examination often revealed a small pouch beyond the internal meatus, and this contained residual urine.

Mr. **Duncan M. Morrison** spoke particularly of neurosis of the bladder, and chronic glandular lymphoid cystitis. In cases of neurosis, examination was usually negative, but the patients who were usually very nervous and irritable complained of marked frequency and urgency, with a dull aching pain in the suprapubic region and in either inguinal region. Careful routine examination showed a contracted urethra and bladder neck, so that the capacity of the bladder was reduced. In some cases an indolent submucous ulcer could be seen, when the urethra was treated by argyrol instillations and gradual dilatation, and at a later stage silver nitrate solution of gradually increasing strength. The ulcer should be touched with 10 per cent. silver nitrate. Failing response, radical resection must be done. Chronic granular lymphoid cystitis occasionally occurred in girls who had marked diurnal and nocturnal frequency, urination usually being precipitate, while the terminal tenesmus might last minutes. Bearing-down pains in the perineum might extend to the clitoris. These women were mentally depressed, and many of them thought they had cancer. The organism most often found was *B. coli*. With the cystoscope a diffuse granular injection with discrete, raised pink nodules over the trigone and the bladder neck was usually seen. Argyrol of 2 per cent. strength should be used, increasing to 10 per cent.

Mr. **H. P. Winsbury White** said that about 75 per cent. of the women he examined had frequency of micturition, and the cause was generally in the pelvis. The symptom could be caused by trifling inflammations of urethra and cervix uteri. A cervical erosion, with or without a muco-purulent discharge, or small granulomata projecting from the os sufficed to produce polyuria. In quite a number of long-standing cases a chronic infection of the urinary tract with *B. coli* was found. Cystitis might be present, but very little in the urine to account for it. In 12 cases in a series of 215 a urethral stricture was present; 53 per cent. of his cases with cervical conditions showed organisms in the urine.

The **Chairman** insisted on the need for routine culture of the urine in these cases. Unless a patient had pus in the urine she could not be said to have cystitis. In some cases the character of the urine coming down from the kidney was such that it caused frequency by irritating the bladder. In a number of other cases he felt sure there was no irritation of the bladder itself. One could do a good deal for functional cases by encouragement. When these patients attended hospital and their attention was taken off their trouble they were often surprised to find how long they had gone without passing water; if they then passed, say, 18 oz. it could be made clear to them that their bladder capacity was adequate, and that if they ceased to worry their trouble would probably disappear. A group of patients was seen, chiefly among old people, whose bladder was always greatly congested, and who always suffered from frequency, with much pain. In these the vesical capacity was small. It was probably due to a long-past infection and was difficult to treat.

SECTION OF TROPICAL DISEASES AND PARASITOLOGY.

AT a meeting of this section on March 3rd Dr. CLEMENT CHESTERMAN read a paper on the training and employment of

African Natives as Medical Assistants.

He pointed out that Africa, with one-fifth of the land surface of the globe, contained but one-thirteenth of the world's population. On the West Coast there were between 25 and 30 people to the square mile, whereas in Central Africa there were but 10 or 15, although it was certain these areas where the population was the greatest asset could support ten times that number. The difficulty of providing a medical and sanitary service for rural Africa was very great, not only geographically, but on account of superstition and certain native beliefs and customs, and our best efforts were liable to be looked upon as a kind of persecution. The only way to solve the problem and avoid misunderstanding was through coöperation with the people themselves. He quoted the late Sir Gordon Guggisberg's high opinion of the educability of the native and stated that he believed that the so-called arrested development, where it was observable, was probably but a defensive mechanism of the normal youth against an education ill-suited to his adult life and environment. Simple medical education and practice was eminently suited to his needs and capacities, but for the very reason that it was apt to raise the youth high above the general level of culture and public opinion with regard to disease, he was correspondingly tempted to lose his balance. For some generations therefore it was advisable for his own sake and for others that he should serve under supervision and not as a private practitioner.

Dr. Chesterman outlined the present practice in Sierra Leone, the Gold Coast, Nigeria, the Sudan, Uganda, Tanganyika Territory, Nyasaland, French West Africa, and the Belgian Congo, dealing in more detail with efforts in which he had been associated for some years at a mission hospital at Yakusu near Stanleyville in the latter colony. The most important equipment for a training school, he said, was first patients, second patients, and third, more patients. For the teaching staff the equipment was the same, spelt with a "ce." The hospital should be constructed to allow of the easy supervision of all departments by a limited staff, and for that reason a central administration block was preferable to scattered buildings.

In describing the various policies and practices he offered some suggestions for the consideration of those who were responsible for the framing of colonial policy in this matter. An A.D.M.S. medical education should be appointed to unify training, text-books, and examinations, and be responsible for the posting and promotion of medical assistants, who gave better service if the personal touch was maintained. Medical officers interested in such work should be encouraged to believe that in that career they would receive promotion to the teaching posts of the higher institutions and administrative posts. Although higher medical education in Africa with a view to the replacement of European doctors was a proper policy where the general educational level demanded it, yet the formation of a large number of more humble and less expensive native "general practitioners" was the only solution to the rural problem. These could best be trained in rural hospitals, a three years' course sufficing, with practice and theory combined from the start, and subsequently employed in dispensaries depending on their alma mater.

Dr. Chesterman hoped that the new spirit of coöperation between governments and missions might be extended into the realm of rural hygiene, and that many of his fraternity might be stimulated to greater efforts; for all who had faced the problem on the field were agreed that although a little knowledge is a dangerous thing, a lot of ignorance was even more dangerous.

HARLEY MEDICAL SOCIETY.

AT the inaugural meeting of this society held on March 10th, the chair was first taken by Dr. MORELAND MCCREA, who explained the origin of the society as an attempt to foster the scientific spirit among members of the Medical Group of the new London Clinic and Nursing Home. These members, he said, essentially constituted a club and not a company, and they realised that without scientific ideals medicine would soon become a trade. Sir LENTHAL CHEATLE then took the chair.

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Origin of Tumours.

He said that it had long been evident that any explanation of the origin of tumours must account for their rapidity of growth. He was convinced that the secret of tumour formation must be approached by the study of normal cells. No complete theory had satisfactorily explained why certain cells occasionally behaved abnormally by growing at a faster rate than the normal rate of the tissue to which they belonged. He enumerated the following established facts about tumours as facts which any ætiological theory would have to explain: (1) Tumour cells grew by their own division and not by converting neighbouring cells into tumour cells. (2) The tumour cell was specific to its original character wherever it might be. (3) Tumour cells were species-specific. (4) A very great many different kinds of tumour were to be found in any one species, even tumours growing from the same kind of tissue showed great differences, and two identical tumours were seldom met. (5) Tumours could be produced by a at many different agents and these agents had factor in common. (6) Every tumour showed a ent period at the beginning of its development, d this latency did not depend on the age of the ject.

The tumour cell was characterised by an alteration its behaviour, not in its apparent structure. obably all cells of the body underwent mitosis at tain times, to replace worn-out cells, but the rate reproduction varied considerably, and the process d not yet been observed in those tissues where it ly occurred at long intervals. There was a beautily exact adjustment to the requirements of the ne cells themselves, and the primary controlling tor must be within the cells. Certainly, the haviour of any cell might be profoundly modified environmental factors, such as hormones, but the sponse to these factors was fixed, and determined its inherent controlling mechanism, inherited m the original germ cells. If a cell or group of lls was found to behave in a radically different anner from that of its neighbours, then some dical change must have taken place in its nucleus

THE GENE THEORY.

Every human cell contained 24 pairs of chromosomes thin its nucleus, and each chromosome contained a st and unknown number of genes. These genes re the controlling factor in the cell's behaviour. e genes in the fertilised germ cell controlled the te and behaviour of all the daughter cells and ensured at every daughter cell should breed true to the rent. This was equally true of somatic cells, and the recognition of this fact lay the explanation of mours. Studies of the germ cell had shown that anges in the nature of the genes could be brought out by extrinsic influences; these mutations were herited by all daughter cells. Most biologists lieved that accidental gene mutations had been ry largely responsible for the evolution of new ecies. If a gene mutation could occur in a germ ll, it could also occur in a somatic cell, with similar sults. The suggestion that tumours might be due mutation in the nucleus of the somatic cell had st been put forward, more than ten years ago, y a German zoologist, Theodor Boveri.

If the gene change produced in the cell was one for cessive reproduction, then a colony of excessively producing cells would soon form, and would all ntinue to breed true, and would increase at the pense of surrounding tissues. This mutation eory explained all the known facts about both ant and animal tumours; it was the missing piece the jigsaw puzzle. It explained why tumour cells ere specific to the tissue in which they arose, and hy they grew from their own cells and not by converting neighbouring cells into tumour cells. It also plained why there were so many different carcinoenic agents and such a great variety of tumours, nd the latent period in tumour formation. The heory was not susceptible to experimental proof, ut relied on logical deductions from observed acts.

There must be other mutations besides that for xcessive reproduction, and many diseases besides umours could probably be explained in this way: ome of the leukæmias, for instance. Melanotic nd keratotic changes in the skin—e.g., xeroderma igmentosum—were examples of mutation. Gene utation could be produced by very many agents, s had been shown by experiment; the agent was ssumed to cause an injury to a gene or group of genes. Obvious results of gene mutation would, however, be seen only exceptionally, as they would not be visible for several cell-generations, and adult cells reproduced but slowly. Skin cells were replaced more often than deeper cells, and changes in them were more obvious; therefore these changes were best known in skin epithelium.

The CHAIRMAN said that there were only two concrete theories before the world concerning the origin of tumours: the virus theory and the gene theory. The former might be incorporated in the latter. In Paget's disease of the nipple a deep carcinoma might arise in the terminal ducts and acini, in addition to the benign superficial condition in the epidermis or upper duct openings; this could be well explained by the gene theory, and he did not believe that it was due to transplantation.

DISCUSSION.

Dr. R. J. LUDFORD showed a series of lantern slides illustrating the gene theory. Chromosomes, he said, showed no structure, and the genes were postulated to explain observed phenomena; they were estimated to measure 20–77 μμ—far below the smallest thing that could be seen under the microscope. The human blood corpuscle measured 7500 μμ. Nevertheless the gene was a very living concept in biology at the present time, occupying much the same position as the atom in physics. The genes were assumed to be ranged in linear fashion—many hundreds of them to each chromosome—and at each cell division each chromosome split longitudinally, so that each daughter cell contained the same number of genes as the parent cell. It was postulated that in every cell of the human body there were 48 chromosomes, 24 of maternal and 24 of paternal origin, the chromosomes being regarded as the physical basis of heredity. The number of chromosomes in tumour cells varied considerably, but at each cell division the same number passed into each daughter cell. Sex was determined by the male germ cells, some of which contained "x" chromosomes and some "y" chromosomes. The female produced "x" cells only. In some cancer cells these special chromosomes could be recognised. Dr. Ludford illustrated the transmission of colour blindness and hæmophilia as gene mutations. It was difficult to see how a cell could retain malignant characteristics over a long period of years without some alteration in its mechanism. The gene theory seemed to offer the best explanation of the phenomena of the cancer cell, although it did not lead anywhere therapeutically. Further research should be directed to discovering some as yet unknown fundamental biological process in the malignant cell.

Dr. J. C. MOTTRAM said that the mutation theory had arisen from the discovery that X radiation could produce malignancy. Once a gene was altered, it was altered for ever, and this rule applied to the cancer cell; the Jensen rat sarcoma remained to-day exactly as it had been when it was first discovered. There was no real difference between a somatic and a genetic mutation. A mutation occurring very late in development would affect a single cell. If it was a change causing rapid division, a tumour would result; if it caused some other alteration, we should probably know nothing about it. He had tried inoculating irradiated cells into animals and had produced a tumour.

Dr. W. E. GYE stressed the hypothetical nature of the gene theory, which was not accepted by all biologists. Hypothesis was being heaped on hypothesis had pus in the urine she could not be said to have cystitis. In some cases the character of the urine coming down from the kidney was such that it caused frequency by irritating the bladder. In a number of other cases he felt sure there was no irritation of the bladder itself. One could do a good deal for functional cases by encouragement. When these patients attended hospital and their attention was taken off their trouble they were often surprised to find how long they had gone without passing water; if they then passed, say, 18 oz. it could be made clear to them that their bladder capacity was adequate, and that if they ceased to worry their trouble would probably disappear. A group of patients was seen, chiefly among old people, whose bladder was always greatly congested, and who always suffered from frequency, with much pain. In these the vesical capacity was small. It was probably due to a long-past infection and was difficult to treat.

SECTION OF TROPICAL DISEASES AND PARASITOLOGY.

AT a meeting of this section on March 3rd Dr. CLEMENT CHESTERMAN read a paper on the training and employment of

African Natives as Medical Assistants.

He pointed out that Africa, with one-fifth of the land surface of the globe, contained but one-thirteenth of the world's population. On the West Coast there were between 25 and 30 people to the square mile, whereas in Central Africa there were but 10 or 15, although it was certain these areas where the population was the greatest asset could support ten times that number. The difficulty of providing a medical and sanitary service for rural Africa was very great, not only geographically, but on account of superstition and certain native beliefs and customs, and our best efforts were liable to be looked upon as a kind of persecution. The only way to solve the problem and avoid misunderstanding was through coöperation with the people themselves. He quoted the late Sir Gordon Guggisberg's high opinion of the educability of the native and stated that he believed that the so-called arrested development, where it was observable, was probably but a defensive mechanism of the normal youth against an education ill-suited to his adult life and environment. Simple medical education and practice was eminently suited to his needs and capacities, but for the very reason that it was apt to raise the youth high above the general level of culture and public opinion with regard to disease, he was correspondingly tempted to lose his balance. For some generations therefore it was advisable for his own sake and for others that he should serve under supervision and not as a private practitioner.

Dr. Chesterman outlined the present practice in Sierra Leone, the Gold Coast, Nigeria, the Sudan, Uganda, Tanganyika Territory, Nyasaland, French West Africa, and the Belgian Congo, dealing in more detail with efforts in which he had been associated for some years at a mission hospital at Yakusu near Stanleyville in the latter colony. The most important equipment for a training school, he said, was first patients, second patients, and third, more patients. For the teaching staff the equipment was the same, spelt with a "ce." The hospital should be constructed to allow of the easy supervision of all departments by a limited staff, and for that reason a central administration block was preferable to scattered buildings.

In describing the various policies and practices he offered some suggestions for the consideration of those who were responsible for the framing of colonial policy in this matter. An A.D.M.S. medical education should be appointed to unify training, text-*books, and examinations, and be responsible for the* posting and promotion of medical assistants, who gave better service if the personal touch was maintained. Medical officers interested in such work should be encouraged to believe that in that career they would receive promotion to the teaching posts of the higher institutions and administrative posts. Although higher medical education in Africa with a view to the replacement of European doctors was a proper policy where the general educational level demanded it, yet the formation of a large number of more humble and less expensive native "general practitioners" was the only solution to the rural problem. These could best be trained in rural hospitals, a three years' course sufficing, with practice and theory combined from the start, and subsequently employed in dispensaries depending on their alma mater.

Dr. Chesterman hoped that the new spirit of coöperation between governments and missions might be extended into the realm of rural hygiene, and that many of his fraternity might be stimulated to greater efforts; for all who had faced the problem on the field were agreed that although a little knowledge is a dangerous thing, a lot of ignorance was even more dangerous.

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ıat determined the incidence of nephritis in infections? It was not the type of organisms rned; the condition could follow all forms of ococci, and occasionally pneumococcal strains found. Nor was it the severity of the infection ıch; mild ambulatory cases of scarlet fever yet lead to severe nephritis. Prof. de Wesselow led cold as an important factor, and it probably ed largely into the causation in trench nephritis, latter was common wherever stationary warfare een established; the Federal Army in the U.S.A. ed greatly from it. In war, too, infection ıncreased by the frequency of septic and ver- ıs wounds. Many cases of acute nephritis were ıbly missed, since in the acute stage it was very ient. After tonsillitis many people might have erular nephritis as a late sequel without knowing He thought the present way of treating litis was irrational. A case of scarlet fever robably detained in bed for three weeks, whereas e of tonsillitis, which probably carried as big of nephritis, was allowed up as soon as the erature came down. He was not advocating a long bed treatment for tonsillitis as for nephritis, xaminations of the urine in the second and third after tonsillitis would prevent the subsequent opment of nephritis in many cases. The ıosis of acute glomerular nephritis in children admittedly better than in adults, possibly ıse the mother quickly called in a doctor, whereas ıdult did not seek medical advice until much The vast majority of cases of acute glomerular ritis cleared up, the urine being free of albumin ır later; 6000 men who had had trench nephritis ed no trace of nephritis when examined for on.

ıere remained the class in which albumin and persisted and became chronic. A few of these a short stormy course, with œdema, hyper- on, and renal inadequacy, and might die in a months. Most of them, however, were relegated latent group, those apparently fit who yet passed They constituted an obscure underworld of nic nephritics. The condition could be said, in neral way, to shorten life, and insurance officers d on that idea. But Addis quoted a case in which erminal uræmia did not supervene until 55 years the original nephritis. The infection of a ey might persist long after the original site of tion—such as an infected finger wound—had red up; he had seen cases in which removal of focal infection aggravated the kidney condition. vas wise to remove the focal infection, but in y cases the nephritic disease was not arrested by means. There was need of evidence as to the t effect of dealing with the focal sepsis.

r. **Bernard Myers** said that in children death ırred within a few years of the onset of the nephritis to even mild scarlet fever, and in his experience tment had been very disappointing. With regard ıdults, in several families whose members began to show evidence of nephritis at about 50 years of age, none lived beyond 60; all apparently had vulnerable kidneys, the cells of which could not continue under the stress of life when the body was declining.

DOUBTFUL VALUE OF STATISTICS.

Dr. **H. Morley Fletcher** felt doubtful of the value of statistics on such a subject as nephritis, even when emanating from the Registrar-General's returns, since so many cases were certified as having died of nephritis when that was not the fatal disease. He pointed out that most of the remarks so far had dealt with infective, not non-infective nephritis. Contrary to what Dr. Myers had said, he had found that acute hæmorrhagic nephritis in children often terminated favourably, and the child might grow up without giving evidence of kidney damage, even on renal efficiency tests. But in adults he had not seen such a case clear up; usually it terminated fatally after a short term. He thought a long-standing *B. coli* infection of the kidney might be a factor in bringing about the chronic diffuse nephritis which was manifest between 17 and 25 years of age. He went on to speak of nephrosis, and the slowly progressive cases of "renal rickets."

Dr. **A. F. Hurst** spoke highly of Dr. Osman's work on the biochemical side, in recognition of which a number of beds and a special out-patient department had been placed at his disposal for dealing with and studying these cases. He thought some of his arguments, based on the statistics, were somewhat fallacious, especially as he added so many deaths from cerebral hæmorrhage, heart disease, and cirrhosis of the liver to his total of deaths from nephritis. One might, in the same way, say that 95 per cent. of cases of cirrhosis had some evidence of tubercle, and so should be added to the deaths from tuberculosis. He did not think it was possible to say that 20 per cent. of patients with cirrhosis died of nephritis, however severe the latter might be, because they also died from their cirrhosis. He stressed the importance of the treatment with alkalis. By prophylactic treatment after acute infections, such as scarlet fever, it was possible greatly to reduce the incidence of nephritis; in scarlet fever the mortality had come down under this treatment from 5 per cent. to under 1 per cent. He agreed that there was a danger after removing septic foci of a flare-up of the nephritic condition, and that was one of the ways in which vaccination was of value; for if an autogenous vaccine were given two or three times before the infective focus was removed the danger of such nephritic exacerbation was very greatly reduced. He regarded the constitutional factor as very important. He spoke of a family in which 25 members died of nephritis in four generations. If relatives in such families had periodic examinations, it was probable that the average life would be considerably prolonged.

EFFECT OF NASOPHARYNGEAL SEPSIS.

Sir **William Willcox** said it would be generally agreed that prognosis and determination of ætiology was more difficult in cases of glomerular nephritis than in any other cases. He confirmed the importance of infections of the respiratory tract. In a large proportion of cases the tonsils seemed to be the starting point, but even if the tonsils were removed other septic foci were likely to be still active and to perpetuate the nephritis. During the war he was struck by the remarkable progress to recovery made by the many trench nephritis cases he saw;

and analogy on analogy. Analogies were very dangerous in medicine, as in other branches of science. The pathological characteristic of cancer was the power of autonomous growth, and this was entirely explicable in terms of things known to be true in other diseases, rendering these analogies unnecessary. The production of a new tumour from a tumour filtrate was quite precise and specific; the filtrate of the Rous sarcoma always produced a spindle cell, and had been doing so for 21 years. Each filtrate reproduced the cell from which it came, two factors being necessary, an intrinsic and an extrinsic. The gene theory had had a greater advantage than any other, but remained largely speculative.

Mr. LOCKHART MUMMERY, in reply, said that the virus theory demanded the assumption that an infective agent could maintain amazing specificity for years on end; no other infective agent known would reproduce itself consistently in this way. Only something producing gene changes could do this, specially in the minute quantities used. What, he inquired, did the cell-free filtrate do in the animal into which it was introduced?

MEDICAL SOCIETY OF LONDON.

Non-infective Nephritis.

AT the meeting held on March 14th, Mr. HERBERT TILLEY, the President, being in the chair, a discussion took place on non-infective nephritis.

NEPHRITIS AS A CAUSE OF DEATH.

Dr. ARTHUR OSMAN, who opened, said the title "non-suppurative nephritis" would have better limited the debate, since most forms of nephritis encountered in practice were infective, either directly or indirectly. He invited a consideration of bilateral non-suppurative inflammation of the kidneys as a whole, disregarding the various types into which kidney disease had been divided. He first drew attention to the wide prevalence of this group of diseases in the community. It ranked seventh in importance as judged by the causes of death as given by the Registrar-General, preceding ones including cancer, rheumatism, heart disease, tuberculosis, and asthma. During the past century and right up to the present time nephritis had been steadily on the increase, except for the years 1915 to 1920, when there was a definite drop, probably connected with the war. It was not merely a question of the withdrawal from the general population of a large number of healthy men for Army purposes, as the same drop was seen in women. As chronic nephritis was a disease chiefly of the elderly, care must be taken that the proportion of elderly people to the general population was taken into account, and in this country the proportion of elderly persons living had greatly increased since 1911. Japan and U.S.A. showed a very high death-rate from this cause; and at the other end of the scale stood Turkey and Belgium, while Scotland showed better figures than did England and Wales. He had found it impossible to correlate these figures with such factors as climate, racial characteristics, and diet, but in considering these comparative figures regard must be had to such tropical diseases as malaria, and to hookworm disease and syphilis in various parts of the world; the relative consumption of alcohol might have significance, though it was difficult to say in what direction. So far, he had spoken of deaths certified as having been due to nephritis, but it would not be disputed that nephritis was present in a large number of people who appeared to owe their death to other diseases. Herringham had found, on investigating 3500 autopsies, that 22 per cent. of the cases from medical wards alone had renal disease; 37 per cent. of those with renal disease died of nephritis. It was significant that 95 per cent. of cases dying of cerebral hæmorrhage had renal fibrosis. He had analysed the histological reports of sections in 2000 autopsies at Guy's Hospital and had found that certainly 95 per cent. had chronic nephritis of a type usually called primary nephritis; there were changes in the capsule or in the glomerular tuft. In 1929, 25,000 deaths occurred in this country from cerebral hæmorrhage, and one could assume that in a large proportion chronic nephritis was a terminal event. Of 131 autopsies on cases of cirrhosis o liver 54 per cent. showed renal disease. Probably a large proportion of cases certified as having died o valvular disease of the heart had chronic nephritis Herringham had found that of 255 patients over 2 years of age who had died from valvular diseas of the heart, 36 per cent. had renal disease. Thes figures were based upon macroscopic inspection but Dr. Osman thought that histological examinatio would probably confirm them. Many elderly pe with functional nephritis who died perhaps afte operation or anæsthesia would not have died ha their kidneys been functioning better. The numb of such cases could not be assessed, but if any mea could be found of arriving at the proportion of peop who died from functional inadequacy of the kidne he thought that nephritis would be found to ran fourth among the important causes of death in th country, the position it occupied in the United Sta of America. He thought he had established t fact that nephritis was one of the chief causes death in this country, and that it was still increasi

THE INCIDENCE OF NEPHRITIS.

Prof. L. D. S. DE WESSELOW spoke of the investi tion into the cause of trench nephritis he had carri out in association with Prof. H. MacLean on a v large scale. Some 50,000 infantrymen were examin these men having just landed in France after co pleting three months of training at home with breaking down or being marked down into a lo category. They were not very fine physical sp mens, but it was at a late stage of the war and th represented the average working population. Morn urines were examined, and after excluding all who were passing pus or had spermatozoa, it was fou that 5 per cent. had albuminuria, 2 per cent. high degree. Epithelial casts were present in per cent. The conclusion was therefore justified t 1 per cent. of presumably fit men were suffering fro definite grade of albuminuria which led to the pass of epithelial casts. Very few of these nephri broke down under the exposure and dampness trench warfare, sufficiently to cause their admiss to hospital. Figures on this point were, howe largely spoiled because at this stage in the war wastage of infantry was about 75 per cent. of strength every three months. He did not think men in question had hypertensive conditions, as t were men under 40, but they had a chronic lat glomerulo-nephritis, and at some time in their li they had probably had nephritis without having kno it. Hæmorrhagic nephritis was the most interest form, and, if hypertensive nephritis was exclud the most common. It presented possibilities

REVIEWS AND NOTICES OF BOOKS

Midwifery.

By Ten Teachers. Fourth edition. Edited by COMYNS BERKELEY, J. S. FAIRBAIRN, and CLIFFORD WHITE. London: Edward Arnold and Co. 1931. Pp. 740. 18s.

THE fourth edition of this well-known work shows changes in the personnel of the contributors, though the schools represented remain the same. Mr. Clifford White has taken the place of Mr. Russell Andrews as a member of the editorial trio. Several of the chapters have been completely rewritten and new matter has been included.

This book was written with the primary object of preparing the candidate for his final examination, but since most doctors after qualifying continue to consult their accustomed text-book, it is necessary to consider the work from the point of view of the practitioner as well as of the student. The volume contains very much that is good and a little that is less good. The teaching throughout is on orthodox lines; sometimes so strictly orthodox that the reader ceases to feel the personality of the writer behind the lines. Controversial issues are for the most part avoided, and there is perhaps some danger that the student, however hungry at the outset, who is fed so consistently on dogma, may have his appetite dulled. There are five sections: (1) the physiology and pathology of normal pregnancy; (2) normal labour and abnormal labour; (3) the puerperium; (4) the new-born child; (5) relief of pain and suffering in obstetric practice.

The first section is clearly written and well illustrated. Toxæmias are accurately described. The wisdom of placing albuminuria of pregnancy in one chapter, and pre-eclampsia and eclampsia in another, is doubtful. In dealing with hyperemesis gravidarum more information might be given as to the indications for terminating pregnancy; the significance of jaundice is not mentioned. On the other hand, the great danger of rapidly emptying the uterus from below, even when the gestation period is less than three months, deserves more emphasis than it gets here. The section on hydatidiform mole is excellent. Reference is made to Aschheim's work (the name is wrongly spelt), but not of the important application of the Zondek-Aschheim test in the diagnosis of chorion epithelioma. Syphilis in pregnancy is but scantily treated, and in order to study this subject one has to read three sections of the book—diseases of pregnancy, diseases of the placenta, and diseases of the new-born. The section on the mechanism of labour follows orthodox lines. In the section on breech deliveries no mention is made of the value of a preliminary episiotomy in a primiparous patient in order to allow of an easy delivery of the after-coming head, and the advice to deal with the arms as soon as the feet slip out may not meet with general approval. Fig. 131 does not depict a "sacroposterior position" as is stated in the legend. The section on contraction of the pelvis is very good, and the details of the management of a case of disproportion are excellent. The legends of Figs. 174 and 175 appear to be reversed. In the section on artificial infant feeding, perhaps undue prominence is given to complicated mixtures containing extra fat, lime water, and barley water. Stress is laid on the addition of extra fat to diluted cow's milk, but there is no warning of the need to reduce the fat intake in certain types of case. The addition of a "teaspoonful of 50 per cent. cod-liver oil" to each 5 oz. of feed seems to be excessive. It is curious that attention is not drawn to the danger of scorbutic symptoms developing in artificially fed infants; the use of fruit juice in supplying the lacking vitamin C is not mentioned. In dealing with white asphyxia of the new-born, the importance of protecting the child from further shock is stated, but the value of this advice is lessened by the accompanying description and pictures of Sylvester's method of artificial respiration which receives priority of place in the methods of resuscitation. The use of lobeline is not mentioned.

The volume ends with a full description of the method of giving a blood transfusion and the means whereby the blood groups may be determined. This is an excellent and valuable section and deals with a subject which is too often omitted by teachers of midwifery. We note with satisfaction that throughout the book the medico-legal aspect of the subject is constantly kept in mind, and much useful advice on these matters is given.

The book well fulfils its prime object of supplying the student with a simple and straightforward account of modern midwifery practice.

Geschlechtskrankheiten.

Second edition. By Dr. ROBERT OTTO STEIN, Professor of Dermatology and Syphilology in the University of Vienna. Munich: J. F. Lehmann. Pp. 219. M.10.

THIS is a second enlarged edition of the work by Prof. Stein which first appeared in 1921. In this country we are accustomed to look upon syphilis, ulcus molle, and gonorrhœa as the venereal trilogy, with pediculosis and scabies closely associated. Dr. Stein leaves out scabies, but includes as venereal diseases: pediculosis, herpes genitalis, molluscum contagiosum, acute ulcer of the vulva due to the *Bacillus crassus*, and lymphogranulomatosis inguinalis. The treatment described of all these conditions follows conventional lines in the main. Syphilis, however, seems to be less radically treated than in this country. Primary syphilis is defined as that stage in which, though spirochæte-positive, the Wassermann is negative when treatment starts. This is "cured" by two courses of neo-salvarsan and bismuth, with a two-month interval between treatments. The test for cure is a Wassermann negative reaction one year later. Any case then positive is treated as a secondary syphilis. Secondary syphilis is defined as any early case with a positive Wassermann. Here the treatment is three courses of neo-salvarsan and bismuth, with two-month intervals between courses. Further continuations are based on the Wassermann. A fixed positive Wassermann which is discovered six to ten years after adequate treatment, when present without clinical signs, is not considered an indication for further treatment; but a positive cerebro-spinal fluid Wassermann is a condition calling imperatively for malarial therapy. Tertiary syphilis is treated with small doses of neo-salvarsan and iodides.

The section on gonorrhœa is much less complete than that on syphilis. In the acute stages reliance is placed on the organic silver preparations, intravenous trypaflavin, and balsams by the mouth. Chronic posterior urethritis is still treated in Vienna he wished one could see the same in ordinary hospital cases of nephritis. A patient with glomerular nephritis left untreated went steadily downhill. He always insisted on a routine X ray examination of nasal and other sinuses in these cases; it was surprising how many revealed sepsis. He spoke of successes he had had by immunising the blood of a healthy person with streptococcus from the suffering person and giving several 20 c.cm. blood transfusions. He advocated steady perseverance in treatment, even in apparently hopeless cases.

Dr. E. P. **Poulton** referred to the value of the urea-concentration test and of the urea-clearance test. In removing diseased teeth, a preliminary clearing of the pockets of pus might ward off an exacerbation of symptoms.

Dr. T. **Jenner Hoskin** said he had long felt that some of the old nephritic patients with hypertension owed their condition to a scarlatinal basis early in life. These people had high blood pressure before the normal time. He appreciated the great value of the alkaline treatment.

Dr. **Bernard Schlesinger** thought the increased incidence of nephritis was to some extent attributable to a wave of streptococcal infection immediately after the termination of the war. If tonsillitis played such an important part in causing nephritis, why did rheumatic children, who showed a high incidence of tonsillitis, seldom have nephritis? In 2000 rheumatic children under his observation there was no sign of nephritis, though their urine was examined every week.

Dr. J. H. **Gibbons** spoke of alcohol and syphilis as contributory factors.

Dr. H. **Gainsborough** alluded to unexpected recovery in cases of nephritis of severe degree. One was a postman who had the disease nine months, and had a systolic pressure of 210, high blood-urea, and renal retinitis, with advanced vascular changes; he recovered and was able to resume his work.

NEW INVENTIONS

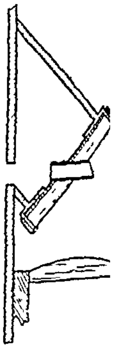
A DEVICE FOR PREVENTING GLARE IN ELECTRIC OPHTHALMOSCOPES.

The introduction of the electric ophthalmoscope has greatly increased facilities for the examination of the interior of the eye, but the internal position of the source of the illumination within the instrument has produced certain new difficulties which the older reflecting ophthalmoscope did not possess. The electric lamp within the stem of the electric ophthalmoscope throws a beam of light parallel to the instrument, and this beam must be bent at right angles to enter the eye of the patient. Prisms and mirrors of various designs have been used to effect this bending. The desideratum is such a complete bending of the rays of light into the eye of the patient that the surgeon has a clear peep-hole through the instrument along the beam of light, and free from all disturbances such as will be caused by rays of light that may be diverted backward from the instrument so as to reach his own eye. If there are such aberrant rays the surgeon cannot see the fundus clearly by reason of the haze that is caused by the rays. The effect is somewhat similar to that disturbance to visibility produced by the rays of the head-lamps of a car when there is a slight mist at night. These disturbing effects have become more evident with the increase in power of the light available.

The aberrant rays are brought about by several conditions. If a glass mirror with a drilled hole be used in the ophthalmoscope the beam of light will impinge upon the upper edge of this hole, and no matter how it may be blackened this edge will scatter a blaze of disturbing light. If the mirror has no drilled hole, but only a gap in the silvering, the hinder surface of the glass itself will reflect any light that may fall upon it from above the ophthalmoscope, and the slightest imperfection in the glass or dust upon it will increase the disturbance.

To overcome this defect, Marple cut out the upper edge of the mirror and used one of U shape. It was very successful, but the mirror was too fragile. A polished stainless steel mirror of U shape was substituted, but this has two drawbacks in that it has a lower reflecting power and soon scratches, still further reducing the amount of light reflected. Prisms, such as were used in the first ophthalmoscopes, avoided some of the difficulties, but if they are well designed they are costly and permit very little variation o the beam, while the inexpensive ones are inefficient

Recently, in discussing electric ophthalmoscope with Mr. J. W. Tudor Thomas, of Cardiff, he told m that there had come into his possession an instrumen the origin of which he did not know, which was fre from these defects. A small tube had been fitte into the drilled hole of the glass mirror. This devic is the simplest, most natural, and effective correctio of the one difficulty of the electric ophthalmoscop It does exactly what we instinctively do to protect our eyes from the glare. We shield them with our hands, or with hat-brims, or we fit vizors to the wind-screens of our cars.



Section throu
mirror fitt
with gla
shield.

A small thin-walled tube is mounted within the hole of the mirror of the ophthalmoscope, *the forward* end of the tube is cut at an angle so that there projects from the hole of the mirror a crescentic ledge or shield. This shield fits the lower edge of the drilled hole and projects just sufficiently to cast a shadow over the hole. When the shield is in position no aberrant rays can be diverted into the surgeon's eye, and he gets a perfectly clear view into the patient's eye. For a mirror set at an angle of 45° to the beam from the lamp, and a hole of 2 mm. diameter, the shield fitted to the lower edge of the hole must project 2·5 mm. to provide complete protection. The shield is made of metal, and is fitted to the metal bed-plate of t mirror, but is independent of the mirror glass, so that it *secure and not likely to be broken.* Also the mirror gl can be detached without disturbing the metal shield.

One small difficulty arose in the use of the devic When the beam from the lamp was exactly centr to the mirror, it was found that the shield cut o the focused rays when they met at the position the shield. This difficulty was overcome by slight decentering the lamp, so that the beam when exact focused upon the mirror impinged upon it to o side of the drilled hole. This decentering has drawback. Messrs. Rayner, of New Bond-stre have fitted this shield to the new electric ophthalm scope made by them for me, and which was describ in your issue of Jan. 23rd, 1932. The device is a re advantage, and it will be the standard pattern. has been fitted to other instruments, and has effect a great improvement in each case.

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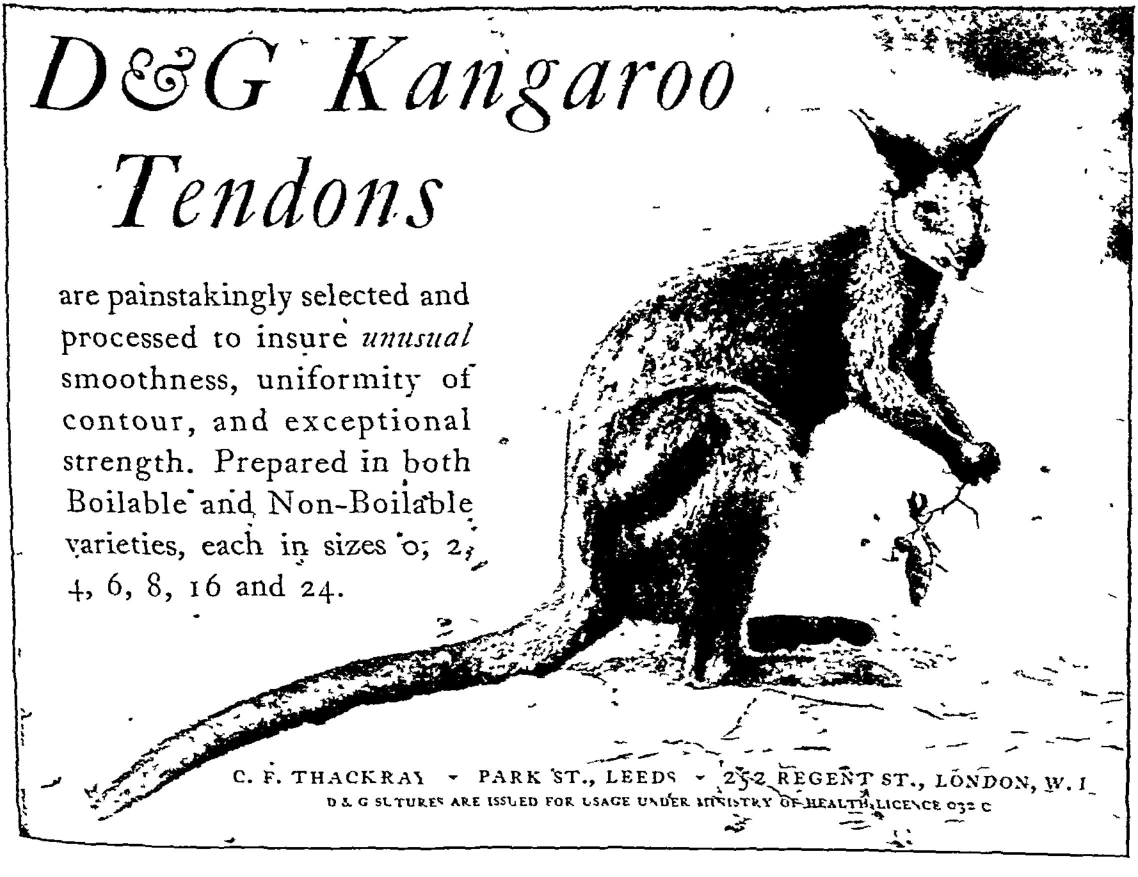

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with Guyon's syringe and silver nitrate. The section on gonorrhœa in women is disappointing. None the less this is a most valuable work, mainly on account of the 75 beautifully produced and life-like coloured illustrations. With the exceptions of MacCormac's edition of Jacobi's Dermachromes, and McDonagh's work on Venereal Diseases, there is no text-book in English remotely approaching this in the excellency of its illustrations. It is a marvel of production at the price.

Fields of Psychology.

By Glenn De Vere Higginson, Assistant Professor of Psychology, University of Illinois. London: George Allen and Unwin, Ltd. 1931. Pp. 613. 15*s.*

The title of this book has been wisely chosen because its subject matter illustrates the breadth and comprehensiveness of psychological facts and psychological methods. As the book concerns a study of man in relationship to his environment, the author has found it necessary to deal with heredity and environment and animal behaviour exhibited in reflexes, tropisms, and instincts. This gives a useful background to individual human psychology. The psychology of social formation and such differential phenomena as race, sex, and temperament are then discussed. Interesting chapters are devoted to efficiency, and such everyday subjects as advertising and salemanship are adequately considered. The psychology of crime is dealt with in relationship to insanity, and such legal problems as testimony, responsibility, and punishment are given due attention. The book contains also some useful chapters on the varieties of mental disorder and their treatment by modern methods. It is richly documented, and for this reason is a valuable introduction for all those who wish to delve into specific psychological problems.

Towards National Health.

By J. Anthony Delmege, M.R.C.S., L.R.C.P., D.P.H. London: William Heinemann (Medical Books), Ltd. 1931. Pp. 234. 21*s.*

To those who have occasion, from time to time, to seek accurate information about the public health movements of the past, this book will be very welcome. It traces the development of hygienic ideas and practice from the time of the early civilisation of Crete, Egypt, Palestine, Greece, and Rome, through the dark and middle ages to modern times, until the passage of the Great Public Health Act of 1875. Inevitably the history of public health in this country in the sixteenth, seventeenth, eighteenth, and nineteenth centuries occupies the major portion of the letterpress, and due notice is taken of the relevant [illegible] industrial, political, and religious [illegible] work is comprehensive and accurate. There are many illustrations, most of them interesting and all well reproduced, but their value would have been increased if their origin and exact dates had been given.

Journal of Pathology and Bacteriology.

The March number (Vol. XXXV., No. 2) contains the following papers: The spleen in streptococcal infections, by J. W. Orr (London). Experimentally in rats the earliest change appears in the lymphocytes and histiocytes on the margin between the lymphoid follicles and the pulp: polynuclear leucocytes appear at a later stage.—Completely healed dissecting aneurysm of the aorta with obliteration of the sac, by T. Shennan (Aberdeen). A man of 64 in whom four partial ruptures of the aorta had occurred, the last into the pericardium and fatal. Dissecting aneurysms do not begin in atheromatous ulcers as is commonly supposed.—Some observations on anticomplementary sera, by R. D. Mackenzie and R. S. Marshall (Nigeria). Common enough in natives in Northern Nigeria to interfere with complement-fixation tests.—Natural immunity to streptococcal toxin, by L. M. Bryce and F. M. Burnet (Melbourne). Many infants start life with a supply of staphylococcal antitoxin derived from their mothers; this soon fades away and is replaced by antitoxin made by themselves in response to infection and subinfection. —Some observations on cellular immunity to snake venom, by C. H. Kellaway and F. E. Williams (Melbourne). The hearts of rabbits immunised to cobra venom are more resistant than those of normal animals in perfusion experiments, but the authors think that this is due to residual traces of antibody rather than a change in the cells themselves.—Cellular immunity and antibody in the tissue spaces by F. M. Burnet, C. H. Kellaway, and F. E. William (Melbourne). Experiments on the pulmonary an coronary circulation yielded no evidence of an inherent cellular resistance in actively immunise animals which could not be explained by antibod in the tissue fluids.—The toxicity of irradiate ergosterol, by J. B. Duguid, M. M. Duggan, an J. Gough (Cardiff). An excess of vitamin D produc arterial lesions much more easily in rats on a synthet diet rich in calcium than with normal food; t presence or absence of other vitamins is relative unimportant.—Disease in relation to carcinoge agents among 60,000 experimental mice, by J. Twort and C. C. Twort (Manchester). A valual review of the pathology, other than neoplastic, o great number of mice painted with various carci genic tars and oils, and similar substances. Th do more to the animals than produce tumours; peculiar lipoid degeneration of the liver and extens hyaline change in the liver, adrenal, thyroid, and s are particularly notable. Many parasites described.—Some properties of immune sera act against fowl-tumour viruses, by C. H. Andre (London). Birds bearing either of two slow-grow tumours develop antibodies which neutralise activity of filtrates of the Rous tumour.—Staph coccal toxin and antitoxin, by H. J. Parish W. H. M. Clark (London). Active toxin can prepared by Burnet's method and may be detoxica with formaldehyde. The antitoxin is efficaci against toxin and to some extent against live cultu —Two parathyroid tumours without osteitis fibro one associated with acromegaly, by G. Hadfield H. Rogers (London and Bristol). As might expected, tumours do not always produce the s effect.—Carcinoma of the pituitary gland abdominal metastases, by M. D. Gilmour (Glasg An example of a rare degree of malignancy in a wo of 55.—The relative incidence of the human bovine types of tubercle bacilli in human tubercu in Scotland, by A. S. Griffith and W. T. Mu (Cambridge and Glenlomond). Confirms with m fresh data the previous observations that bo infections are relatively more important in Scot than England. The explanation remains obscur Immunity to Jensen's rat sarcoma produced by tu extracts, by H. Chambers and G. M. Scott (Lond Tumour tissue allowed to autolyse for a short renders rats refractory to the subsequent impla tion of the same tumour.—Foot-and-mouth dis lesions in the ear epidermis of inoculated guinea- by T. Hare (London). The skin of the ear rem infective longer than other tissues; this is shown to be associated with the presence of mi scopic lesions whose evolution is described and figu —Intra-epithelial spread of squamous-celled c noma, by H. E. Harding (Sheffield). On the thig an old woman: analogous to Paget's disease of nipple.

THE LANCET.

LONDON: SATURDAY, MARCH 19, 1932.

MATERNITY HOSPITAL SERVICES.

THE functions of a maternity hospital differ rom those ordinarily fulfilled by a general hospital y the inclusion of attendance on patients in heir own homes and by the much more prominent lace occupied by services of an educational and ocial character. Since the supervision of the xpectant mother came to be recognised as an ntegral part of midwifery practice, wider developnents have taken place in varying degree and long somewhat divergent lines in individual nstitutions and there is great need to facilitate omparison of methods employed and results ttained for the information and common good of all hospitals concerned. The paper by Prof. MUNRO KERR and Dr. MACLENNAN on the factors influencing mortality in maternity hospitals (see p. 633) is a sequel to one published last year[1] on the mortality and morbidity in the domiciliary services of maternity hospitals in which Dr. SHARMAN collaborated with Prof. MUNRO KERR. The two together form a striking picture of the work done by a large maternity hospital. The communication in our present issue describes an attempt to follow the plan adopted in the Interim Report of the Departmental Committee on Maternal Mortality and Morbidity, that of classifying the deaths by a form of inquest, or post-mortem inquiry, under the heading of the particular "primary avoidable factor" thought to have determined the tragedy. Admittedly the determination of such a factor must be largely a matter of personal opinion, but though investigation of all cases by one observer may be impracticable, at least an agreed form of presentation is essential to progress. Many interesting points arise out of the more recent study and these are clearly summarised at the end of the paper. Here we would draw attention particularly to the discussion of the institutional problem, where the various factors affecting the results obtained by an institution are considered. The authors complain of the difficulty confronting those who attempt to compare the results attained by the different institutions because of failure to record them in accordance with the unified system proposed by the Obstetrical Section of the Royal Society of Medicine some years ago, after consultation with the larger maternity hospitals throughout the country. This first step in the right direction was a very useful piece of work. To be effective, however, the plan outlined must be adopted by all concerned and it is to be hoped that the few remaining hospitals that continue to issue reports of the old individualistic type will soon appreciate the advantages of a uniform pattern in the presentation of material facts.

One conclusion reached by Prof. MUNRO KERR and his collaborator is that "hospitals with a unified control, or, better still, with a resident master, show the most satisfactory results." From the point of view of teaching, whether of undergraduates or post-graduates, the superiority of what may be termed from its outstanding example, the "Rotunda" system is generally admitted. This system was the one advocated by the Obstetrical Section in a memorandum issued in 1919 on the training of medical students. It gives opportunities for continuous teaching on obstetric complications that cannot be obtained under the system of a visiting staff and enables the student to see the conduct of a case throughout its stages by a senior and experienced officer. The new evidence that it is also advantageous in the care of patients strengthens the plea for its wider adoption. Two factors apart from the organisation of the institution are thought to have an important influence in producing differences in mortality- and morbidity-rates—the nature of the population served and the type of case admitted. The fallacy arising from the latter may be minimised by recording separately the "booked" and the "unbooked" or emergency cases. The further division, as in the Glasgow figures, into emergencies sent in by doctors or midwives and those women who do not apply till the end of pregnancy or the onset of labour—many of them in order to escape a supervision they dislike—adds no difficulties, for the two together are the same as the single list of unbooked cases. It should however be remembered that the maternity hospital in Glasgow refuses no women because they have not booked and that, while the antenatal supervision of many of the booked cases was inadequate, presumably it is owing to the women not attending the clinics at all or not often enough. The efficiency of the antenatal supervision depends on other factors than the nature of the population served, such as the power of the institution to acquire the confidence of the women and thus to secure their regular attendance; visiting by nurses, lady almoners or health visitors, together with a proper system of recording which of the patients have been told to report again, will greatly lessen the number of those who fail to obey instructions. When the supervision of the "booked" cases seems inadequate, attention should be directed towards establishing closer contact with the mothers.

A test of efficiency in another direction is the degree of success attained in avoiding the transference of patients attended at home into hospital as emergencies; to this end arrangements should be made for the confinement within the hospital of women whose labour seems likely to be complicated. These aspects of maternity work were

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[1] THE LANCET, 1931, ii., 201.

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SHOULD ABORTION BE LEGALISED?

LATELY, from the Bench, Mr. Justice McCARDIE emanded an extension of knowledge of contraeption, compulsory eugenic sterilisation, and the galisation of abortion on other than therapeutic rounds. These three measures taken together can e looked upon as practical expressions of a onsistent philosophy of life which is to-day ometimes described as scientific humanism. This ttitude is difficult to epitomise in a sentence. n one of its aspects it implies a disbelief in an ltimate and unchangeable moral law superaturally revealed to man and characterising, as lo physical laws, the essential nature of the niverse. The scientific humanist takes his stand n the changing nature of man. As human needs hange, so also must change the dogmas and moral recepts which regulate social conduct. Since he is he possessor of an intelligence greatly superior o that of any other animal, man is not only entitled but, in this view, bound to make use of his endowment in whatever way he thinks best to secure the maximum happiness and physical well-being of his contemporaries and descendants. In general it may be said that the attitude of the medical profession towards contemporary morality is humanistic rather than dogmatic. In the past, for instance, it was believed that the acquisition of a venereal disease was a heaven-sent castigation for sin. As soon as adequate means of treating venereal diseases were discovered, the question arose as to whether this point of view was compatible with the most efficient prevention and cure of these diseases. The profession had little difficulty in concluding that it was not. In the sphere of psychological medicine, likewise, it has been found that an attitude of strict ethical neutrality on the part of the physician is best calculated to induce the patient to speak of himself without dissimulation and shame, and therefore to lead to the best therapeutic results.

The many problems arising from the rapid increase of population that has occurred in all civilised countries in the last hundred years, and the recognition that much human misery can be prevented by an intelligent regulation of genetic processes, have probably been the two factors chiefly responsible for the publicity which has been accorded to Mr. Justice McCARDIE's remarks. Of the measures he advocated, the provision of medical supervision and instruction in birth control is now rapidly taking place, and the proposal to legalise eugenic sterilisation is receiving increasing consideration from medical men. The last and most drastic proposal—to legalise the practice of abortion—naturally excited the most violent opposition and would now seem furthest from practical fulfilment. The proposal to legalise abortion has hitherto received much less serious attention in this country than in such countries as Germany and Russia, where advocacy of this measure has, since the war, been closely linked with what may be called the birth control movement. For this reason, the appearance of a responsible book upon the subject, written primarily for the medical profession, is to be welcomed. The writer[1] holds that the increasing traffic in abortifacient proprietary preparations—most of them inefficacious—and the state of the law which permits of their indirect advertisement are strongly to be deprecated. With regard to the expediency of combining, as the Russians have done, the legal suppression of both traffic and advertisements with the provision of medical facilities for obtaining abortion, Dr. PARRY expresses himself somewhat ambiguously, but at a meeting of the Medico-Legal Society on March 15th he made it quite clear that he thought it would be deplorable for this country to follow the Russian example. In the discussion which followed, legal opinion was universally in favour of a modification of the law in this country or even of legalisation of abortion, while with few exceptions the medical members present supported the existing position. Mr. CLAUDE MULLINS feared that, in view of the widespread practice of secret abortion, public opinion might so far outstrip the law that juries would acquit prisoners in the face of the evidence, as once they used to acquit prisoners in danger of hanging for theft. The danger to the mother of abortion, even when procured under the most favourable conditions, was fully discussed, but no exact statistics were quoted to show how great this danger was. Dr. W. G. EARENZEY, K.C., pointed out that if secret abortion was as widespread as Dr. PARRY had led the meeting to believe the danger to life of the operation, even in unskilled hands, must have been exaggerated. If it were to be done at all it was better that it should be performed by skilled operators in the open. Lord RIDDELL, who took the chair, thought that women were little influenced by warnings of danger or disablement, and that the demand for the performance of abortion was increasing. The claims of the child were well supported by Dr. LETITIA FAIRFIELD: she mentioned a striking case of a woman raped on a lonely road, who might surely have been justified in attempting to procure abortion; to the profit of history she preferred to give birth to WILLIAM THE CONQUEROR. Such instances, however, are hardly relevant to the situation which has to be faced in modern England. Dr. EARENZEY took account only of the fatal cases reported as following attempts at abortion. Medical men know well that many of these escape detection; as we point out on p. 638, far more harm is done to health than is ever revealed in a court of law. The extent to which this harm is due to the disorderly haste inseparable from the secrecy in which illegal operations must be performed should be explored. "Uniformly satisfactory" statistics are said to have accumulated during ten years' experience of legalised abortion in modern Russia.[2] If these are confirmed after searching investigation they will, from the strictly medical point of view, deserve serious consideration by those planning new legislation appropriate to the outlook and habits of our times.

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[1] Criminal Abortion. By L. A. Parry, M.D., B.S., F.R.C.S. London: John Bale, Sons and Danielsson, Ltd. 1932. Pp. 203. 10s 6d.

[2] See *THE LANCET*, 1931, ii., 1255.

clearly emphasised in the earlier paper on domiciliary services where attention was drawn to the need for concentrating on an improvement in the attendance of prospective mothers. There also was shown a substantial decrease in the percentage of abnormalities in the district practice in the latter part of the period studied, due apparently to the fact that grave operations in the homes of the patients were discouraged, all cases in which abnormality was anticipated being treated in hospital. Of the 20,000 cases analysed about a fifth were attended by students and the other four-fifths by pupil-midwives, gloves being used by the former but not by the latter. A decidedly lower mortality- and morbidity-rate was shown in the cases attended by students. In this connexion a recent paper by Miss Carter[2] who till recently was the supervising sister of the out-patient district of University College Hospital, London, is of particular interest. It dealt with the effect of better arrangements made for the nursing of the patients in their homes and contrasted the results attained with those of a preceding period before these arrangements were in force. In the earlier period the student went to the case with only a handywoman to assist him, but from April, 1930, he had with him a registered nurse-midwife who subsequently carried out the nursing of both mother and baby. Both carried masks, sterilised gowns, towels, dressings, kidney dishes and dry gloves. The antenatal care was thorough, under 5 per cent. of the patients escaping one examination at least and over 84 per cent. having more than one examination. There were no deaths on the district or among cases transferred to hospital, and the morbidity-rate was taken as the criterion. It showed that the incidence of notifiable pyrexia was reduced to less than half, from 5·2 before to 2·19 per cent. after the advent of the nurses. A strong plea is made for this conjunction of skilled nurses with the students working on the district not only for the comfort and other advantages it brings to the mother, but also for the value to the student in teaching him how to work with nurses, and how much good nursing means to the mother.

All these communications provide welcome evidence of the progressive efforts made by our great maternity hospitals to improve both their care of the woman during childbearing, and the training of medical students and pupil-midwives for the service of the whole community. More might be done to make a knowledge of the results in the institutions and the methods by which they are attained readily available, and as comparable as the variable factors in each permit, if they were set out in a common form. But the chief lesson to be drawn is that the maternity hospital of to-day must provide social as well as medical services, particularly for its out-patients, and must study the special circumstances of the individual mother if it is to do the best for her and get the best out of her.

VACCINE TREATMENT OF DISSEMINATED SCLEROSIS.

In our present issue Sir James Purves-Stewart and Dr. F. D. M. Hocking report the results of the treatment of a further series of patients suffering from disseminated sclerosis with a vaccine composed of the "Spherula insularis." This body was originally described by Miss K. Chevassut in cultures made from the cerebro-spinal fluid of patients with disseminated sclerosis. It is now admitted, however, that similar spherules are found in other circumstances, and the authors report that they have been observed in cultures made from the fluid in a wide range of organi nervous diseases. The spherula has thus shed it insularity and cannot be regarded as specific t disseminated sclerosis. Many successful remedie have been first adopted for theoretical reason which have ultimately proved to be unsound The authors claim that, although the reason which led them to adopt the vaccine treatment c disseminated sclerosis have been shown to b invalid, nevertheless the treatment remains efficacious, and they report both serological an clinical improvement in a proportion of patient thus treated during the period of six month from March to September, 1931. The change which are described in the cerebro-spinal fluid a similar to those reported by Sir James in h previous communication.[1] At that time w expressed the view that "the significance of the changes could have been better appreciated controls had been investigated." This criticis remains valid, for in the absence of controls w are unable to say that the fluid in untreated cas would not have shown equal or even great changes for the better.

The clinical results described by Sir Jam Purves-Stewart do not in our opinion justi any conclusions as to the value of the vacci treatment. It will be widely felt that six mont is far too short a period upon which to base concl sions as to the results of treatment in so chron a disease as disseminated sclerosis. Althoug Sir James reports the after-histories of the fo patients described in detail in his previo communication, he says nothing about the sevent patients who were at that time reported as bei under treatment and who have therefore no been under observation for more than two year No experienced clinician, "bearing in mind th well-known tendency of this disease to underg spontaneous remissions," will feel that the vacci treatment can be credited with the clinical improv ment reported in this new series of cases. Eve however, if it could be demonstrated by observatio over a number of years of treated cases and c controls that the vaccine treatment was beneficia it would still remain to be proved whether th results obtained were better than those achieve by other non-specific therapeutic measures, fo example, those which rely frankly upon th production of protein shock.

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[2] The Lancet, Jan. 2nd, p. 42.

[1] The Lancet, 1930, i., 560.

tuberculin-tested herds should be adequately pasteurised or, if this is impossible, sterilised or boiled. It expresses a strong opinion that no such processes ought to be accepted as a substitute for cleanliness in production, though it regards pasteurisation, as defined in the regulations of the Ministry of Health, as an effective method of destroying pathogenic micro-organisms. It advises that no milk that has been heat-treated in any way shall be lawfully sold as raw milk, but that it should have some officially approved designation. The committee's findings show that the question of whether pasteurisation impairs the food value of milk has not been conclusively answered, and that considerable evidence exists that pasteurisation reduces the incidence of all milk-borne diseases; it suggests that the sale of milk from free herds as raw or pasteurised be permitted, provided that each kind is officially labelled. Finally, it adopts the suggestion—originally put forward by Dr. Savage—that the larger local authorities should have power: to require all milk sold within their jurisdiction, other than that from non-reacting herds, to be effectively pasteurised; to forbid the importation of milk heat-treated other than by pasteurisation; to enforce compulsory classification of all grades of milk sold within their areas; and to exercise adequate supervision and control over the health of all persons engaged in the industry.

We have given a brief and in some respects an inadequate summary of the findings of the committee. It is for the public conscience to say to what extent its labours are to bear fruit.

THE GERSON DIET.

THE Gerson-Hermannsdorfer-Sauerbruch diet has been tested in Norway in two different institutions with results that are, perhaps, the more impressive because they are published at a stage when critics have had time to collect failures and disappointments wherewith to produce the negative phase in the history of the "cure." At a recent meeting of the Medical Society of Oslo, a paper[1] was read on the use of this diet in tuberculosis of the skin by Prof. E. Bruusgaard, in charge of the Dermatological Department of the Rikshospital, and by Dr. E. Hval. During the past two years all the cases of tuberculosis of the skin admitted to this hospital have been given the Gerson diet with some modifications to suit Norwegian conditions. Great care was taken that the supply of raw fruit and vegetables, as well as of fresh juices, should be liberal, and the average of 2600 calories was made up as follows: protein 77 g., fat 152 g., and carbohydrate 215 g. Of the 75 cases of tuberculosis of the skin thus treated, 62 were cases of lupus vulgaris. Seventeen patients, whose treatment was limited to this diet, were rendered symptom-free—a term which conveys a warning of a possible relapse. There were 29 who were considerably improved and were still under treatment. In some cases a few lupus nodules persisted at the completion of this treatment which was then supplemented by exposures to the Finsen lamp. Among the 24 patients thus treated, 19 were rendered symptom-free, and five were considerably improved. "One may conjecture that diet combined with Finsen light will in the future be the chief treatment in skin tuberculosis." This considered opinion is the weightier for being voiced by an authority noted in the Scandinavian countries for his caution and critical sense. During the dietetic treatment, a marked improvement in the patients' general health was observed simultaneously with the changes for the better in the local condition. It would, indeed, seem that the diet has a general stimulating effect on the natural defences of the body, rather than any specific influence. The tissue-absorbing action of the diet is one of its conspicuous features. Masses of hypertrophic scar tissue, in which lupus infiltrations are embedded, are absorbed with remarkable rapidity. In this way otherwise intractable cases are rendered amenable to Finsen light treatment.

The Gerson diet for the typical clientèle seeking hydropathic establishments has recently been given a trial by Dr. E. Möinichen and Dr. H. Fröshaug,[2] of the Midtstuen hydropathic establishment near Oslo. Among their 45 patients thus treated were 23 suffering from hyperpiesis. "With a background of 25 years' experience with the physical and dietetic treatment of these conditions, some importance may be attached to our impression at Midtstuen that the Gerson diet is considerably more useful than other systems of treatment previously employed."

THE INSURANCE OF PEDESTRIANS.

THE heavy casualties caused by road traffic are regarded by the public with strange equanimity. The total is said to be nearly 200,000 a year, whereof roughly 1 in every 25 is fatal. Arguing that about one-half of the total happen to pedestrians or pedal cyclists, the Pedestrians' Association proposes an amendment of the law. If a pedestrian is knocked down by a motor-car, he clearly cannot recover damages if he himself was negligent; he clearly ought to recover them if the driver was negligent; but what is to happen if neither side was to blame or—a commoner case—if there is no evidence to show who was to blame? What ought not to happen, argues the Association, is that the pedestrian should suffer the whole of the loss; the driver should be made prima facie liable and in fact should pay the pedestrian irrespective of any evidence of negligence. Let Parliament pass a Bill to that effect; the cost to the motorist will only be a slight increase in his insurance premium. Most medical practitioners are motorists. They, like other motorists, will probably answer that it is wrong to remove one hardship by creating another; that Parliament sanctions the present conditions of road traffic and the motorist should not be penalised for taking advantage of that sanction; in fact that motor-cars are not man-eating tigers. To this the Association will reply that in many cases the law already imposes liability to compensate irrespective of negligence. Thus innkeepers are liable for the goods of their guests; common carriers are responsible for the goods entrusted to them; employers must compensate workmen for accidents happening in the course of their employment; railway companies must pay for damage to crops caused by sparks from engines; aeroplanes must make good damage or loss which they cause in their flight, taking off or landing; and so on. Moreover, it was long ago held to be a common law nuisance to bring upon a road a machine which is likely to frighten horses "of ordinary nerve and courage." But this last instance suggests the rejoinder that the average horse has given up shying at motor-cars and that human beings need not despair of adapting themselves to the presence and movements of machines. The statistics of road accidents seem to indicate that the young of the human species have

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[1] Norsk Mag. f. Laegevid., November, 1931.

[2] Tidssk. f. d. Norske Laegefor., Jan. 15th, 1932.

ANNOTATIONS

THE PROBLEM OF SAFE MILK.

ABOUT a year ago we summed up in a leading article[1] the current evidence on the milk problem, from which it appeared that the milk consumption of this country is considerably less per head of population than that of many others, the defect being ascribed in some part at least to the failure of all concerned to produce an adequate supply of safe milk. The problem centres around the elimination from milk of the bacilli of bovine tuberculosis, although other milk-borne diseases and dirt may act as deterrents. Mention was made of the action of the People's League of Health in appointing a committee to study the whole question of bovine tuberculosis and of the wisdom of suspending judgment until this committee had had time to report. That report, which is now in print,[2] deserves the closest study. The committee itself comprised approximately 100 of the most eminent authorities in the country on every side of the question—medical, veterinary, laboratory, agricultural, and industrial—and it appointed three subcommittees to investigate the incidence of bovine tuberculosis and the most effective means of preventing its spread among cattle and man. The late Mr. E. B. Turner was its first chairman, then Dr. W. G. Savage. It is sufficient to say that no more representative or competent body could possibly be collected in this country to discuss this matter.

On the facts as they exist at present the findings of the committee do not disclose anything very novel. The figures of incidence are scarce, a fact which does not do credit to the Government departments concerned. In the words of the report :—

> Since no comprehensive body of statistics exists in Great Britain other than that in Dr. Savage's books, and since no extensive testing over the whole country or even over a whole county has ever been made, calculations have to be based on samples, the majority of which have not been taken at random.

There is no system by which the results of tuberculin testing or of abattoir statistics are collated. One reason for this deficiency is, conceivably, that the returns of tuberculin tests are confidential, but the committee was evidently considerably handicapped by the absence of this information. The Ministry of Health provided figures for a limited period, and other figures were provided by various investigators, and some were taken from the returns of foreign countries for comparison. The average of the figures available shows that at least 40 per cent. of the cows in this country are infected, though only a minority are infective ; that about 0·2 per cent. of all cows are suffering from tuberculosis of the udder, and are therefore probably excreting living tubercle bacilli in the milk ; that about 40 per cent. of cows slaughtered in public slaughter-houses show naked-eye lesions of tuberculosis ; and that an average of 6·7 per cent. of raw market milk contains living tubercle bacilli. The figures for the incidence in man suggest that about 6 per cent. of all deaths from tuberculosis are caused by the bovine type of bacillus ; that about 2000 deaths occur annually from this cause, mostly in children, apart from an immense amount of invalidity ; and that at least 4000 cases of bovine infection develop each year. The disease has certainly diminished in the past 80 years, and the factors judged by the committee to be responsible for this decrease are improvement in milk production and in child welfare, the fall being accelerated during recent years by pasteurisation and sterilisation.

The part of the committee's work that demands the closest and most urgent attention is, however, its advice on the means which should be adopted to stamp out the disease ultimately, and to check its incidence and its spread while the fundamental measures are being developed, a process which must take a long time. "The obvious aim of all arrangements," says the report, "is the provision of a milk-supply untainted by the bacillus of tubercle." The Milk and Dairies Act, 1915, makes it an offence to sell milk from infected cows, but in order to convict it is necessary to prove knowledge on the part of the defendant, and the provision is therefore only of limited value. The report stresses the necessity for a clear distinction between two problems : (*a*) the eradication of tuberculosis in cattle, and (*b*) the provision of a safe milk-supply ; the first problem is entirely veterinary and should be dealt with by the Ministry of Agriculture, whereas the second problem is essentially medical and should be dealt with by the Ministry of Health. Nevertheless, since the two problems overlap, it is desirable that the two Ministries should work in close cooperation on a joint plan. The measures recommended for the eradication of tuberculosis in cattle are three : (1) to increase the number of tubercle-free herds ; (2) to detect and eliminate "open" cases ; and (3) to encourage the perfection of prophylactic vaccination. The committee urges the necessity for official assistance in the building up of tuberculin-tested herds and suggests several practical measures. It consider that the Tuberculosis Order of 1925 has not led t any appreciable progress towards the eradication o open cases, and anticipates that no real progress ca be expected until a scheme is devised which wi include the herd owner, the local authority, th veterinary inspector, and the bacteriologist. I suggests a number of points with which such a schem should deal specifically. It holds that, in order t secure the goodwill of the farmer, an educationa campaign will be necessary ; in such work th veterinary inspectors could give valuable assistanc As it points out, the extension proposed is along lin already in force. It recommends that the variou prophylactic vaccines available be investigated muc more carefully than they have been hitherto, an that experiments both in the laboratory and on th farm should be actively encouraged. Among measur to provide a safe milk-supply, the committee rul out as obviously impracticable the wholesale slaught of reacting cows, but regards as helpful a routin inspection of all dairy cattle by competent veterinar surgeons, if sufficient funds are available. To increas the supply from free herds, it recommends a mod fication of the Milk Order of 1923 to provide th new names should be given to the different grad of designated milks in order to indicate definitel the nature and quality of each ; that the fee charge for a licence should be abolished ; and that th number of licencing authorities should be reduce These measures, however, belong to the fundament campaign to free all dairy herds from tuberculosi As practical immediate measures the committe advocates that all raw milk that does not come fro abdominal affections already referred to is certain, and the observations of J. B. Carnett, set forth in a number of contributions,[1] are illuminating and suggestive. In effect, he believes that a neuritis of the nerve trunks supplying the abdominal wall is a quite common complaint, a neuritis which may be, but is not necessarily, due to some infective focus in the abdomen, possibly the gall-bladder. More than four years ago he discussed[2] the mimicry of gall-bladder disease in cases of neuritis of the ninth and tenth right intercostal nerves. He mentioned the identical pain at the costal margin rediscovered by Dr. Carmalt-Jones, and sometimes a hyperæsthesia. There are, perhaps, other tender points, where the nerves perforate the rectus sheath or where the lateral cutaneous branches emerge. He insists that the tenderness is as pronounced when the abdominal muscles are thrown into contraction as when they are relaxed, and avers that the spontaneous pain may vary from a dragging sensation to a disturbance which cannot be distinguished from a colic. It is therefore interesting to read that Dr. Carmalt-Jones has found cases of "apparently typical biliary colic, with a tender cartilage," in which at operation "a normal gall-bladder was found." Whether Carnett's views will be established must depend upon the observation of other clinicians. He is careful to point out that the discovery of such parietal neuritis does not exclude gall-bladder disease, and indeed is found often to accompany it; but when other reliable signs, particularly jaundice, the presence of a palpably distended gall-bladder, or a positive dye test are wanting, it does not seem justifiable to proceed to operation.

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[1] THE LANCET, 1931, ii., 1037.

[2] A Survey of Tuberculosis of Bovine Origin in Great Britain. People's League of Health, 12, Stratford-place, London, W.1. Pp. 44. 1s. 6*d*., postage 1½*d*.

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[1] Amer. Jour. Med. Sci., 1927, clxxiv., 579; and Med. Jour. and Record, 1929, cxxix., 64.

[2] Ann. of Surg., 1927, lxxxvi., 747.

GOOD AND BAD PROPAGANDA.

THE new British Health Resorts Association has a useful part to play in the near future, and we hope and believe that it will prove equal to its task. But there is undoubted danger in the circumstances of its foundation. At the Hastings conference reported in our columns last week, Lieut.-Colonel R. H. Elliot rightly insisted that the movement would lose the present support of the medical profession if it showed signs of commercialism; but he might have gone further and disclaimed medical interest in any appeal to narrow patriotism. As a profession our object is to treat our patients as well as possible—not only to treat them with British remedies. It would be a great pity if supporters of this Association were to spoil their case by ignoring or dismissing the virtues of foreign travel and foreign cures. No amount of proclamation to the contrary will prevent our remembering that complete change of language, scene, people, food, and climate is often as useful as it is recreative. But this does not mean that the Association has no object. Far from it. Supposing a Londoner felt that Hyde Park might be made more beautiful and that more people might be drawn to enjoy it. Would he begin by saying that the Park had all the charms of the country—birds, lakes, trees, and all complete? If he was wise, he would surely accept the inherent limitations of Hyde Park and say that it was our duty to make it as beautiful as possible, since many Londoners could never go further. It so happens that Hyde Park has in fact become very charming in its peculiar way, so that it is worth while for visitors from the country to come to see it. This, however, is not so much the result of propaganda as of planting bulbs and introducing foreign birds, and employing artists. The amenities of the countryside—that is to say of foreign parts—are again available to rich people now that the ban on money exchange has been withdrawn. At all times and in any case the rich will look after themselves. But the vast mass of our population can never go abroad for health, and it is in the interests of this majority, which at present goes lacking what it could easily have, that we would like the British Health Resorts Association to work. There is much to be done on our coasts, much to be gained from them, and much to be learnt about them. The sense of these aims and objects is in no way dependent on a fashion in economic philosophy.

DUST IN THE COTTON INDUSTRY.

IN 1927 a departmental committee was appointed to inquire into the respiratory disease found among cotton operatives working in card-rooms. The committee worked under the chairmanship of Mr. J. Jackson, Deputy Chief Inspector of Factories, and had as secretary Dr. S. A. Henry. The medical profession was also represented by Prof. George Murray. In the report now published[1] some valuable information about the conditions of the workers is to be found. In the historical review it is pointed out that THE LANCET published one of the first papers to draw attention to the injurious effects of dust in this industry.[2] Various suggestions have since been made as to the exact constituent of the dust which is responsible for damage to health and this problem is still unsolved. The constituents in the dust liberated during the processes of stripping and carding are fragments of cotton hairs and of leaf and seed coat, fungus mycelium, spores, bacteria, and mineral matter; the greatest amount of dust is found in Egyptian cotton. The committee find that much of the dust is due to lack of adequate cleaning of the cotton in the preliminary blowing-room process, and yet more to the practices of "wafting" and "brushing down" to remove dust which has settled on the machinery. A pharmacological test showed that histamine or some allied product was present in aqueous extracts of the finer portions of card-room dust, and this is considered to be capable of causing ill-health, but an allergen may also be present.

The clinical investigation of operatives showed no specific conditions but merely an ordinary bronchitis such as that which occurs in the general population. The committee found that the reduction of dust and improvement in ventilation already carried out had certainly reduced the amount of discomfort and ill-health, but that the sickness-rate from respiratory disease is still higher among male card-room operatives than among other male cotton operatives. There was no marked incidence of tuberculous disease, of silicosis, or of aspergillosis. The committee are of the unanimous opinion that the present excess of sickness among card-room operatives could be considerably reduced, if not eliminated, were the cotton more thoroughly cleaned in the earlier stages—either in the blowing-room or in the process of ginning before import. They consider that an abnormal sickness-rate among workers in a card-room should be regarded as prima facie evidence that dust is not being sufficiently removed and/or that the ventilation is inadequate.

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[1] Report of the Departmental Committee on Dust in Card-rooms in the Cotton Industry. H.M. Stationery Office. 1932. Pp. 96. 1s. 6*d*.

[2] THE LANCET, 1863, ii., 648.

learnt to do so more quickly than their elders. One statement in the Pedestrians' Association's case is challenging. "As the law stands, even a person killed on a pavement has no claim if the driver is exonerated from blame." It is true that in one instance. not long ago, where a motor-car mounted a pavement owing to a skid on a half-frozen road, the injured person's claim failed; the incident was held to be a mere accident and not negligence. But in another case the Court of Appeal decided that the mere fact that a motor-car was found damaging pedestrians on a pavement was at any rate some evidence of negligence. Is it not reasonable to retain some distinction between the motorist who is, and the motorist who is not, negligent?

EAR DISEASE IN FEVER HOSPITALS.

THE problems of prevention and treatment of ear disease in fever hospitals differ from those in ordinary practice, and the clinical conditions and the methods of treatment adopted are not necessarily applicable elsewhere. That part of the annual report of the London County Council for 1930[1] is allocated to Mr. T. B. Layton's account of the treatment of ear disease in the fever hospitals under the Council's control; this makes interesting reading for otologists. When he was first appointed otologist to the fever hospitals ten years ago, his conception of ear disease was that the inflammation spread from the throat to the middle ear, stayed there awhile. and then passed over to the mastoid region. He now believes that the inflammation involves the mucous membrane of the entire middle-ear cleft practically simultaneously in the majority of cases, and that it often subsides with or without rupture of the drumhead. This later view is in conformity with what we believe to be the opinion of most otologists. Early paracentesis of the membrana tympani is generally considered to be of immense value in cutting short the disease; but in Mr. Layton's work, chiefly among little children suffering from scarlet fever, he has found small help from this operation. The principal reason for this failure is the inability to get the patients at the right time, for in scarlatinal otitis pain is rare and, when it occurs, only precedes rupture by an hour or so, rise of temperature is an unreliable guide, and the first symptom of ear disease is a discharge on to the pillow. Routine daily examination of all drumheads was proved impracticable; it took Mr. Layton three hours to examine both ears of 60 patients, and such an examination every day is obviously impossible; but with this early rupture of the drum paracentesis is hardly necessary, though this need by no means diminish the conception of its value in other forms of otitis. In conformity with most of his colleagues, Mr. Layton believes that the cause of chronicity is secondary infection from the meatus; he is further of opinion that the growth of the organisms present in the skin of the meatus can be repressed by keeping the skin dry. He has therefore discontinued syringing and the use of peroxide of hydrogen in the routine treatment of discharging ears, and employs only spirit or glycerin as the basis of applications. But he relies almost entirely on frequent mopping out of the meatus with cotton-wool mops, and teaches quite young children to carry out the procedure for themselves. This is doubtless a very successful method of treatment, but it could be criticised on the grounds that it is impossible to keep the meatus dry when the ear is discharging freely, and that secondary infection may be introduced from the children's hands on to the mops as well as from the meatal skin. In the treatment of mastoiditis with retro-aural swelling, occurring in the acute stage of the fever, he employs Wilde's incision, operating later on the mastoid, however, if the middle ear does not get well. All cases in which otorrhœa persists for more than 21 days are entered in a special report; a number of these are placed in the category of "symptomless mastoiditis," because they have no tenderness or any symptoms except discharge. Mr. Layton does not approve of removing adenoids or tonsils in these cases; he admits that in a small number of cases removal of the lateral portion of the nasopharyngeal lymphoid tissue has had a good effect, but says that there have been as many failures as successes. In our view this small operation would be justified if it succeeds in even 50 per cent. of cases. His objections to a more complete operation are that it removes lymphoid tissue which the patient needs, and that it results in compensatory hypertrophy of such lymphoid tissue as is left. The more usual view is that there is excessive hypertrophy of the lymphoid tissue in such patients, and the general experience is that its removal is frequently followed by cessation of the otorrhœa; the excellent effect on the ear of this operation is also seen in the improvement of hearing which it produces in cases of catarrhal deafness. It is true that hypertrophy of the lymphoid tissue in the pharynx sometimes follows extirpation of tonsils and adenoids, but this is not by any means the rule and does not occur until after the ear has healed. Mr. Layton acknowledges that his views on this matter are quite contrary to those that may be deduced from certain statistics that have been published, but holds them none the less firmly.

THE DIAGNOSIS OF CHOLECYSTITIS.

ELSEWHERE in this issue Prof. D. W. Carmalt-Jones calls attention to a physical sign which he regards as significant of disturbance of gall-bladder function. It is tenderness on palpating the lower border of the right costal margin in the region of the eighth costal cartilage. This tenderness has been fairly constantly present in patients coming under his care, though an analysis of 20 of his cases presented in his paper certainly arouses a suspicion as to the validity of the interpretation he places upon this sign. For though in only two of the 20 cases was such tenderness absent, it was found in five patients who had previously been operated upon for cholecystitis. Presumably some at least of these five people had lost their gall-bladders. Viewed from this aspect, Dr. Carmalt-Jones's contribution invites reflection on that group of patients who suffer from abdominal pain, often in attacks, which simulate very closely those associated with definite visceral disease, and in whom a laparotomy fails to reveal the expected cause, or indeed any demonstrable lesion. It arouses speculation about the true cause of referred pain in abdominal disease. Is there such a phenomenon as a viscero-cutaneous reflex of pain, as Head and Mackenzie believed, or is there only a peritoneo-cutaneous spread which can only occur when the inflammatory process has extended to the parietal peritoneum, as Mr. John Morley would have us believe? There are powerful arguments on both sides, and convincing proofs that one or other of these mechanisms does not exist is wanting. That some other condition is present in the obscure

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[1] London County Council. Annual Report, 1930. Vol. IV., Part III. P. S. King and Son. No. 2877. 5s.

SPECIAL ARTICLES

AN INVESTIGATION INTO THE MORTALITY IN MATERNITY HOSPITALS

AND THE INFLUENCING FACTORS.*

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AND

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The Departmental Committee on Maternal Mortality and Morbidity introduced into their Interim Report the results of a novel and interesting investigation made by a special subcommittee. This subcommittee attempted to determine in the fatal cases investigated throughout the country the reason or cause of death, or as Eden[1] puts it, "they endeavoured to pick out the point at which in their judgment the management of the cases had first gone wrong." This they termed the "primary avoidable factor."

We have been so impressed with the objective of the subcommittee in the investigation they undertook, that we have made a very thorough investigation of all the fatal cases in the Glasgow Royal Maternity Hospital for the years 1926–1930 inclusive. We feel that an investigation of this character, confined entirely to the various aspects of institutional mortality, might shed further light on the broader problem of the national maternal mortality.

The fatalities analysed represent the total deaths in the practice of the hospital, for we have included not only the deaths in hospital but also through the assistance of the Department of Health we have been able to follow up the cases of sepsis which were transferred to the fever hospitals and died there. At the outset it is necessary to mention that the number of abnormal cases admitted to the hospital is exceedingly high. In 1926, 58 per cent. of the admissions presented abnormal features. The numbers rose steadily until in 1930 the abnormal admissions constituted 70 per cent. of the admissions.

TABLE I.

Showing the number of cases treated by Cæsarean section and forceps, and the number of cases of accidental hæmorrhage, placenta prævia, and eclampsia.

Year.	Cæsarean section.	Forceps.	Eclampsia.	Accidental hæmorrhage.	Placenta prævia.
1926	125	260	69	115	86
1927	112	239	86	103	66
1928	127	226	75	131	89
1929	101	290	93	83	84
1930	184	297	59	112	94
Totals	649	1312	382	544	419

It will be observed from this table that the incidence of various abnormality is high in the Glasgow Royal Maternity and Women's Hospital. This should be considered when the maternal mortality-rate is being discussed.

Tables I. and II. briefly indicate the extent of the work undertaken by the hospital which is run on the unit system by a visiting honorary staff.

TABLE II.

Giving a summary of the total deaths in the different categories, including deaths in cases transferred to fever hospitals on account of puerperal sepsis.

Year.	Categories. A. Total. Cases.	Deaths.	Per cent.	B. Total. Cases.	Deaths.	Per cent.	C. Total. Cases.	Deaths.	Per cent.	Total. Cases in hospital.	Deaths.	Per cent. in all categories.
1926	1785	27	1·5	1226	60	4·9	642	10	1·6	3653	97	2·7
1927	1616	19	1·2	1521	70	4·6	765	8	1·0	3902	97	2·5
1928	1612	22	1·3	1496	79	5·2	833	7	1·8	3941	108	2·7
1929	1347	13	0·9	1671	88	5·2	823	13	1·6	3841	114	2·9
1930	1790	23	1·3	1934	85	4·4	745	12	1·6	4469	120	2·7

Table II. shows the total deaths in the following categories.

A.—Cases under some antenatal supervision, although in many cases this could not be considered adequate.

B.—Emergency cases sent in by doctors or midwives or students working in the outdoor department. Relatively few of these had any adequate antenatal supervision.

C.—These were women who applied for admission without being seen by doctor or midwife. They were not under antenatal supervision.

The results are very far from satisfactory, especially in category B. It is dreadful to think that the mortality-rate in this group is higher than for most abdominal operations.

TABLE III.—*Showing Cases Moribund on Admission.*
Years 1926–1930.

—	Categories. A. 1926	1929	1930	B. 1926	1927	1928	1929	1930	C. 1929	Total (60).
Obstetrical complications	1	—	—	3	1	—	1	1	—	7
Accidental hæmorrhage.	—	—	1	1	—	4	4	3	—	13
Placenta prævia ..	—	1	—	1	2	—	1	2	1	8
Post-partum hæmorrhage	—	—	—	3	—	2	—	6	1	12
Toxæmia pregnancy ..	—	—	—	8	3	1	2	1	—	15
Pulmonary complications	—	—	—	1	1	—	—	—	—	2
Abortion ..	—	—	—	—	1	—	—	1	—	2
Miscellaneous .	—	—	—	—	1	—	—	—	—	1

No fatal cases were recorded in categories A in 1927–1928, and in C in 1926, 1927, 1928, and 1930. As the total deaths occurring in hospital during the five years was 536, the 60 cases accounted for in this table represent 11·1 per cent. of the total. Further, it will be observed that the deaths with relatively few exceptions occur in patients who had received little or no antenatal care. We also consider that faulty judgment in treatment must be regarded as a potent factor in causing these deaths.

To determine the primary avoidable factor in the institutional deaths was now our task. As Table II. included all cases which died under our roof, it was

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* Based on the Indoor Practice of the Glasgow Royal Maternity and Women's Hospital for the years 1926–1930 inclusive.

[1] Proc. Roy. Soc. Med., 1931, xxiv., 401.

They suggest that dust from the flat brush and comb could be reduced by slowing down the brush, and that when a stripping brush is used on a vacuum stripper it should be provided with a cover connected to an exhaust. They would prohibit wafting altogether, and insist that respirators should be worn by all workers removing dust or dirt from the engines or machinery. They recommend that a card-room should be ventilated by a downward draught, to keep the finer particles below breathing level, and they think it desirable that no person suffering from respiratory abnormality should be employed in a card-room. Periodical medical examination would also weed out those who were particularly susceptible to dust or who had become partially affected by it.

Perhaps the most important piece of information that emerges from this careful report of a difficult and complicated investigation is the discovery of histamine in the dust, for, if this substance be present, no method of ventilation at present available can be relied upon to protect the workers. The committee draw attention to the importance of further immediate exploration of this problem.

THE ALPS FOR BIRMINGHAM CHILDREN.

WHEN Mr. Christian Kunzle, head of the firm of C. Kunzle, Ltd., chocolate manufacturers, was last week elected president of the Birmingham Children's Hospital, he announced a scheme he had in mind for giving ailing children the chance of an Alpine cure. Mr. Kunzle now owns the château in his native valley of Davos, originally built by Mr. Buol on the sunny slopes of the Dorfberg and Schiahorn, the greater part of which are included in the estate, and for some years has envisaged the possibility of its use on a large scale as a convalescent resort for weakly people of the hospital class. With this in view, he has gradually bought land in the neighbourhood of his château, and he is prepared to give building sites on this estate for convalescent homes or sanatoriums to house those who are unable to pay for accommodation in existing institutions. Many of his work-people have already enjoyed a holiday in the château, and now to demonstrate the beneficent possibilities of Alpine residence for children to his fellow citizens in Birmingham he has placed at the disposal of the hospital for a period of two years the ground floor and dependance of the château, to which a play and school room and verandahs are being added, providing accommodation for 25 to 30 children and five nurses. The first group of children, which will leave Birmingham on May 26th next, is to consist chiefly of ambulatory cases of asthma, chronic bronchitis, mild pulmonary fibrosis and bronchiectasis, glandular tuberculosis, tuberculosis contacts, children convalescent from a long illness, such as osteomyelitis or empyema, and perhaps a few cases of bone or joint tuberculosis. These children will remain in Davos for a period of three months or longer, and if the experiment proves successful it is intended to establish a permanent branch of the hospital at Davos, either by the purchase and adaptation of an existing house, or by the erection of a new one. In that event the hospital would appoint a resident medical officer; for the present Dr. J. L. Burckhardt, head of the Children's Sanatorium at Davos, has consented to undertake the medical supervision of the children. The cost of the experiment is estimated at £2000 to £3000 a year, some part of which may be requited by the parents or the interested local authority; the Benevolent Fund of C. Kunzle, Ltd., has undertaken to defray the cost of transport of the first batch of children and the entire cost of their keep for three months. Should there be any vacancies children may be accepted whose parents can pay some part at least of the cost of maintenance.

ROYAL MEDICAL BENEVOLENT FUND.

AT the annual meeting of the Fund, held on Tuesday last, the income for the year was reported to be the largest since its foundation, and as a result it had been possible to help a larger number of persons whose circumstances obliged them to seek assistance. There is welcome evidence that the increase is due to the fact that the Fund is receiving support from a wider field, and that its existence and utility are becoming more generally known. In 1921 the income from subscriptions was £3801, while in 1931 the income from the same source amounted to £10,682, an increase of £6881. The income derived from investments increased during the same period from £4107 to £6956—namely, by £2849. The amount of financial help which the Committee have been able to give amounts in all this year to *£14,843*, as against *£7292 in 1921; this* does not include a grant of £224 18*s*. to annuitants under the Barr-Meadows bequest. But in spite of this increased income it has not been possible to meet all the claims made upon the Fund, nor to cover the distress whicl is known to exist. Appeal is accordingly again mad to every medical man and woman to become an annua subscriber. Each year personal appeals are writte by the Committee of the Fund to members of th profession in various parts of the country. Durin 1931 appeals made in Ashford, Barnstaple, Blackpoo Bognor Regis, Canterbury, Exmouth, Falmoutl Folkestone, Grays, Horsham, Lewes, Liverpool, New quay, Penzance, Ramsgate, Sidmouth, Swindo *Taunton, Tonbridge*, Tunbridge Wells, Wincheste Battersea, Harley-street, Putney, and Wandswort brought in £93 8*s*. A special appeal was also mad to British medical men and women living abroa which brought in £82 10*s*. 6*d*. Most of th response was in the *form of subscriptions*, whic will be renewed annually. The cost of thes appeals was £38 6*s*. The Christmas appeal mad by the President realised £220 18*s*. 6*d*., a larger su than in any previous year. The cost of this appe was £3 18*s*. The committee fear that the comin may be a very difficult year, and they expre the hope that each subscriber will get at least o doctor friend to give an annual contributio Especially would they like to see greater suppo coming from the younger members of the medic profession.

A word of gratitude is given in the report to tl whole-hearted and invaluable coöperation of tl Ladies' Guild which collects funds of its own distribute in grants for education and maintenanc the worth of which it would be impossible to exa gerate. After adoption of the report and financi statement Sir Thomas Barlow was re-elected Pres dent, Sir Charters Symonds hon. treasurer, S Percy Sargent and Dr. Lewis Glover hon. secretarie

Mr. F. J. Steward has been elected representati of the Royal College of Surgeons of England upon tl General Medical Council, in succession to Sir Holbu Waring.

While inadequate antenatal care has been indicated as playing such an important part in the conditions referred to, it is obvious that this primary factor may adversely affect any type of obstetric case; this is evidenced by the remaining cases which fall into the group.

II. NEGLIGENCE OF PATIENTS AND FRIENDS.

The second group which deals with cases where gross negligence is the primary avoidable factor is a much smaller group but by no means an insignificant one: 38 out of 466 (8·1 per cent. of the fatal cases) were due to this factor. The preponderance of abortion is striking. There are 13 cases out of the total of 38 in the group (34·2 per cent.). From the other aspect, 13 out of a total of 26 fatalities from abortion were a result of the patient's negligence. It is notorious that patients neglect to intimate the onset of abortion. Social, economic, and occasionally criminal reasons exist for this neglect.

The Glasgow Royal Maternity and Women's Hospital admitted 3453 cases of abortion in the five years under review. There were 26 fatal cases, 18 of which died from septicæmia. There can be no doubt that the admission of large numbers of cases of abortion presents additional difficulties in the administration of a hospital whose primary duty is to care for the parturient woman. The large numbers requiring treatment tend to cause overcrowding. Further, the majority of obstetricians consider such cases a possible source of puerperal infection. The League of Nations statistical report on maternal mortality stated[2]: "As a cause of maternal deaths it (abortion) has become more important than delivery at term."

The other cases in this group are those in which gross symptoms presented themselves and were neglected by the patient. Better education of the public to the grave dangers of neglect in pregnancy would seem to be the only solution for this type of case.

III. FAULTY JUDGMENT AND/OR TECHNIQUE.

Under this heading are grouped 66 out of the total of 466 institutional fatalities (14·1 per cent.). Again this figure (14·1 per cent.) is minimal, as we were unwilling to consider a fatality as preventable except where the judgment and technique showed some definite departure from established practice. It would be invidious to apportion blame in this group to any one source; suffice it to say that midwives, general practitioners, and obstetric specialists being fallible contribute to institutional fatalities by their occasional errors in judgment. In this respect it is our opinion that wherever possible the grosser abnormalities of pregnancy and the difficulties of labour should be treated in an institution, where the greatest facilities are available for adequate treatment of the case. It is obvious that where such treatment is necessary, the earlier the case is in the hands of the institution the greater is the possibility of success. Putting aside personal skill, it is absolutely essential to refrain from difficult obstetric operations in inadequate surroundings. The force of these observations can be readily understood by reference to Table IV., where it will be seen that obstetrical complications and puerperal sepsis comprise the greater part of the fatalities due to faulty judgment and technique.

IV. INTERCURRENT DISEASE.

Turning to the question of intercurrent disease (often unavoidable), there were 64 cases out of a total of 466 (13·7 per cent.) in which intercurrent disease was the primary factor. The cardiac cases (36) constituted 62 per cent. of the group. It is only with the most constant supervision (in hospital if necessary) that any improvement can be made in the fatalities from these cases.

V. UNAVOIDABLE DISASTERS.

Having referred in some detail to the cases in which an avoidable factor was present, we find that there are still 133 cases out of a total of 466 (28·5 per cent.) in which we can find no avoidable factor. That is to say, the antenatal care of the patient was satisfactory, there was no evidence of negligence or intercurrent disease, and the management of the case showed no departure from established practice. Yet these women died.

By far the largest proportion of these cases are those which died of puerperal sepsis, 42 out of 133 (31 per cent.). Where every care has been taken of the pregnant and parturient woman, and where despite that care the patient develops puerperal sepsis, we must in our present state of ignorance of puerperal sepsis consider the case as an unavoidable disaster. Fourteen of the obstetrical complications and 15 toxæmias of pregnancy died despite every reasonable precaution having been taken; again we consider these deaths to be unavoidable. Of the other cases in the group the same might be said.

The Departmental Committee on Maternal Mortality and Morbidity find that in 52 per cent. of the deaths which they investigated no preventable factor actually emerged. With regard to these cases they state definitely that a fuller knowledge of the exact circumstances of death would probably have revealed a primary avoidable factor. We are fortunate in our investigation in having a full knowledge of the exact circumstances of all the deaths we quote, and it is our considered opinion that 28·5 per cent. of the deaths were unpreventable. Thus by our investigation we have been able to reduce the figures representing unpreventable deaths from 52 per cent. to 28·5 per cent. When our knowledge of the ætiology of puerperal sepsis is more exact, and a satisfactory method of treatment is evolved, this figure will be still further lowered. To suggest, however, that maternal mortality can be reduced below a certain level would only create a false impression in the mind of the lay public, and saddle the medical profession with an impossible task.

The Institutional Problem.

To concentrate more particularly on the institutional problem we venture to suggest that the following additional factors play an important part:

(a) Type of case admitted.
(b) Nature of the population served by the institution.
(c) Organisation of the institution.

The mortality and morbidity-rate of institutions such as our own which admit any type of emergency as, for example, the "failed forceps" and the "incomplete abortion," will naturally be relatively higher than that in institutions which deal almost exclusively with the booked case. We stress this point, as the Departmental Committee (Interim Report, paragraph 202) in quoting the excellence of the results in certain institutions fail to specify the type of case admitted.

The nature of the population served by the institution undoubtedly affects the mortality-rate. Where the population served by the institution is afflicted with disease such as rickets (or exophthalmic goitre, Rhine valley), or where the population is composed first necessary to adjust this table by deleting from it those cases which were moribund and in a hopeless condition on admission. Those cases (60 in number) which were admitted to hospital moribund, and who died within six hours of admission without active treatment being possible, are deleted from our ultimate consideration of institutional fatalities. (Table III.)

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[2] League of Nations Monthly Epidem. Rep. R.E.140, July, 1930.

It is our opinion that many of these cases would have been better to have been treated in their own homes. A patient who is suffering from a marked degree of shock, or one who is exsanguinated from post-partum hæmorrhage, is often rendered more seriously ill by her journey in an ambulance from home to hospital.

When a patient in the outdoor practice of the hospital requires assistance and is yet too ill to be removed, the house surgeon in charge has access to services of a senior assistant on the staff, whose duty it is immediately to attend the patient in her home. It would be of advantage if those in private attendance on similar patients to the hospital ones, and faced with similar obstetric emergencies, had the same access to obstetric specialists as do the house surgeons engaged in the hospital outdoor practice.

In Glasgow the public health authorities have already drawn up a roster of obstetric specialists who may be called as consultants to puerperal cases. It is only a step further to institute a "flying squad" of obstetric specialists to deal with urgent intrapartum emergencies which, owing to their nature, are unsuitable for transfer to an institution.

Causes of Death.

Having made the above-mentioned adjustments, we have investigated the fatalities which occurred in the institution from the point of view of the primary avoidable factor.

As far as we can judge, the death-rate of an institution is influenced by the following conditions: (1) Antenatal care. (2) Negligence of patients and friends. (3) Judgment and technique of operators. (4) Complication by intercurrent disease. (5) Unavoidable disasters of pregnancy. These conditions correspond in part to those mentioned on p. 24 of the Departmental Committee's Report. It is now our intention to classify the fatal cases as far as possible under these headings. (Table IV.) The first and second headings, Inadequate Antenatal Care and Negligence of Patients and Friends, require some explanation, as they are difficult to differentiate. Inadequacy of antenatal care results from several causes: (*a*) insufficient available clinics, (*b*) faulty organisation and administration of these clinics, and (*c*) ignorance or neglect on the part of the patient and her friends. The first two factors we do not propose to discuss, as they are rapidly becoming corrected by maternity institutions and local authorities. In our analysis-of-the preventable factors, where there has been evidence of obvious antenatal errors in diagnosis or treatment, the fatalities resulting therefrom have been grouped under faulty judgment and technique. With regard to the third cause of inadequacy—(*c*) ignorance and negligence of the patient and her friends—failure to seek antenatal care has only been classified as "negligence," where the *abnormality present* has been evident to the patient herself, and where the neglect of this condition has been the primary cause of her death. Similarly, where a patient has been offered treatment or advice antenatally, and where this has been *completely neglected,* we have preferred to assign the primary cause of death to gross negligence rather than to lack of adequate antenatal care.

TABLE IV.—*Primary Avoidable Factor 1926–1930.*

—	Antenatal care.	Negligence of patients and friends.	Intercurrent disease.	Judgment and/or technique.	Unavoidable disasters of pregnancy.	Total.
	Total cases, 1926–1930.					
Obstetrical complications —e.g., failed forceps, &c.	15	3	0	26	14	58
Accidental hæmorrhage..	4	2	1	0	4	11
Placenta prævia	16	3	0	0	11	30
Post-partum hæmorrhage	1	0	1	2	2	6
Puerperal sepsis ..	13	3	3	29	42	90
Toxæmias of pregnancy ..	109	12	0	4	15	140
Heart disease	0	0	36	0	0	36
Pulmonary complications	1	1	13	0	4	19
Embolism and thrombosis	0	0	1	0	10	11
Abortion	0	13	0	3	10	26
Miscellaneous causes ..	6	1	9	2	15	33
Anæsthetic deaths ..	0	0	0	0	6	6
Totals	165	38	64	66	133	466

This table excludes ten cases who died of puerperal sepsis after transfer to fever hospital. Data concerning them was insufficient to assess avoidable factor. They have been already shown in Table III. and included in our totals.

I. INADEQUATE ANTENATAL CARE.

It will be seen that inadequate antenatal care was as far as we could judge, the primary avoidabl factor in 165 out of the total of 466 institutiona fatalities (35·3 per cent.). This figure is minimal, a cases were grouped under this heading only wher the cause of death could be definitely assigned to pathological condition, which could have been rectifie or considerably ameliorated by prenatal care.

It is worthy of note that toxæmias of pregnanc constitute by far the greatest proportion of thi group—109 out of a total of 165 in the group ar toxæmias of pregnancy. That is to say, toxæmia of pregnancy constituted 66·5 per cent. of the fat cases where inadequate antenatal care operated a the primary avoidable factor. Viewed from anoth angle it will be observed that there were 140 fataliti in all from toxæmia of pregnancy and 109 of thes (77·8 per cent.) were due to lack of antenatal care.

Considering placenta prævia in the same way will be seen that this condition counts for 16 out 165 (9·7 per cent.) of the group. Also, that of th total of 30 fatalities from placenta prævia, 16 (53·3 p cent.) were *due to inadequate antenatal* care. In a these cases premonitory symptoms of placenta præv (slight hæmorrhage) occurred antenatally, and ha they been given due consideration at the time it more than probable that a fatal issue could hav been averted.

We would draw attention also to the 13 cases puerperal sepsis which we have included in the fir group. These cases presented abnormalities whic might have been corrected. This necessitated co siderable interference in labour. We discussed ver carefully together the grouping *of these cases.* W have included them under Group I. and not und Group III. (Faulty Judgment. &c.) because of ou desire to stress the point that a resultant puerper sepsis may be on occasion due to lack of antenat treatment.

udge and jury, why cannot solicitors reach a settlement in these cases without instructing counsel? t is remarkably unfortunate for a professional man who is defendant in this class of case if it be true hat a plaintiff is not in the frame of mind to examine he merits of the defendant's answer until the claim as been begun before a court of law and all the llegations have been broadcast to the world.

BUDAPEST.

(FROM OUR OWN CORRESPONDENT.)

HOULD NERVOUS CHILDREN BE TAUGHT IN SPECIAL INSTITUTES?

In a recent lecture Dr. O. J. Vértes, director of the National Secondary School for Nervous Children, stated his conviction that in cases of severe nervousness in children the only solution is the removal of the child from home. The patient at his new abode behaves timidly and awkwardly at first, but as soon as he realises that he is among understanding people he settles down. The causes which gave rise to symptoms are removed with the change of residence. The jealously guarded cherished child becomes aware of the fact that he is not the centre of the world, and that others have just as much right to consideration as he has. It is important that the parents should not visit their children too often. This advice sounds so simple that one might conclude that the despatch of the child to a good aunt's or grandmama's house would yield beneficial effects. This is, however, not so. The education of a nervous child needs trained experts, or the child becomes just as tyrannical in his new environment as he was at home. Besides apparent (not real) neglect, important curative agents are a systematic day's routine and instruction in how to work. The child should not be bored for a single moment, and should not have too much time for meditation. In the critical post-war years the number of nervous children increased greatly. These children have to be discovered and appropriate schools found for them. In Budapest the number of children educated in special secondary schools for nervous ailments is 1200.

INVENTION FOR IMPROVING THE QUALITY OF FLOUR.

D. Kuffler invented a method whereby the quality of flour is greatly improved and rendered suitable for patients suffering from dyspepsia and other digestive troubles. The invention—a biochemical process of heating the flour to a very high degree without burning or roasting it—is patented. The flour is conducted through a boiler containing superheated dry air, whereby it loses its water content and one-third of its sugar content, and—as proved by investigations made by the Royal Hungarian Cereals and Flour Experimental Station—the formation of carbonic acid diminishes to a tenth. This purified flour is particularly easy to digest, and causes no heartburn or meteorism even in patients suffering from serious gastric and intestinal troubles: it is said also to have a favourable influence on all disturbances arising out of hyperacidity. This so-called "dietetic flour" is at present stocked in Hungary only by chemists, but it is shortly to be marketed by grocers so that the general public will be able to procure it easily. It is said to suffer no change in the process of overheating, so that the foods prepared from it are undistinguishable in taste from those made with ordinary flour; the only difference is in the colour, which is darker than that of ordinary flour. Some of the Budapest clinics and hospitals have used this flour with success in the diet of patients suffering from gastric and intestinal disturbances.

ASPIRIN POISONING IN HUNGARY.

While aspirin poisoning appears to be rare abroad, in Hungary it is of common occurrence, mostly in suicide cases. The Budapest Ambulance Corps rendered first aid to 230 aspirin suicide cases in 1927, to 206 cases in 1928, and to 154 cases in 1929. The symptoms of intoxication are: vomiting, syncope, photophobia, tinnitus, and general malaise of a fairly severe degree. The pulse-rate is accelerated. The urine contains albumin and occasionally also traces of blood. The number of red blood-cells is diminished, while the quantity of hæmoglobin does not undergo any considerable change so that the condition is that of a toxic polychromæmia, with slight leucocytosis. The sedimentation rate of the blood is normal and blood pressure is slightly diminished. The poisoning takes a fairly rapid course; *if there is no improvement noticeable within* 12 *hours from the onset of symptoms, acid intoxication supervenes. The respiration becomes deep and slow, the heart's action becomes weak, and death* follows paralysis of the respiratory and of the cardiac centres. The routine treatment, as applied by the Budapest clinics, consists of gastric lavage with a well-diluted peroxide of hydrogen solution, or with bicarbonate of soda. Emetics are not recommended. Intestinal irrigations with large doses of bicarbonate of soda, repeated every two to three hours or so until the urine becomes alkaline in reaction, may be of benefit.

PHYSICIANS AND LAWYERS ON BIRTH CONTROL.

The medico-legal section of the Hungarian Social-Democratic party recently held a debate. In his opening address Imre Gyürki remarked that the increase of population to-day is an economic question, and the regulation of births is one of the most important problems of the present age. It is in vain that a great many of those who most vigorously fight in support of the percentage norm in the universities, in respect to those living, protest even against the thought of planning the regulation of births. Dr. Bela Tóth emphasised the fact that medical science is concerned also with social science. The fate, health, and disease of the individual must depend on the social conditions among which he is living. The existing law lays down that only danger to the life of the mother justifies birth control. Danger to the mother, however, may include not only danger of death, but also the reduction of capacity for work, and the dwindling of earning power. In the decision of this important problem the high infant mortality-rate, the housing conditions, and other social problems, such as the prevalence of induced abortions, must be considered. In Hungary the number of induced abortions is estimated at about 100,000 out of a total population of seven and a half millions, and the large majority of cases come from the industrial and agricultural classes. In 1925, 115 sentences were passed against those who attempted to procure abortion, but much more serious was the punishment of those who paid for the operation with their lives. From the statistics he has collected Dr. Tóth estimates the casualties due to induced abortion as 700–800 yearly, and the number of women who are affected with lasting bodily or mental troubles due to abortion as about 10,000. Dr. Latkóczy quoted the opinion of Magnus Hirschfeld, the sexuologist, that out of 1000 cases only three are brought

MEDICINE AND THE LAW.

Criminal Abortion.

Two men pleaded guilty at the Leeds Assizes on Feb. 29th to charges of manslaughter and of performing an illegal operation. The victim was a married woman. Last October, being then a widow with seven children, she re-married. Expecting again to become a mother, she arranged with one of the accused men that she should be operated on at his house by the other of them. She collapsed during the operation; whereupon the two men, with unspeakable callousness, dragged her out of the house in a dying condition and left her by the roadside where her body was eventually found. Mr. Justice Humphreys sentenced the man who had performed the operation to five years' penal servitude and his accomplice to 18 months' hard labour.

It may be hoped that the case may find its way to the Court of Criminal Appeal for the sake of additional publicity and in order that the Court may have an opportunity to confirm Mr. Justice Humphreys' view that the offence of unlawful abortion is a grave one. Utterances by one of his colleagues have raised doubts which this case may remove. Many who regard the question as merely one of birth control do not realise that the serious element in the crime is that life and health are endangered by the inexpert and septic methods of these furtive and unlawful practitioners. Far more harm is done than is ever revealed in a court of justice. The difficulty of obtaining evidence is notorious, and nobody imagines that the number of prosecutions represents any serious proportion of the number of offences. The accused man who conducted the operation in the Leeds case was a weaver, aged 41; his companion was a wool teaser, aged 62. As the learned judge pointed out, women seem shockingly ignorant of the terrible risks they run by putting themselves in such persons' hands. The judge observed that counsel for one of the men had spoken of the ethics of abortion, "whatever the ethics of such a crime may mean." "But," he added, "it is no part of the duty of a judge trying a case to discuss the ethics of an offence which is a crime under the laws of the country."

Notification of Diseases and Confidentiality.

In the columns of our contemporary the *Medical Officer,* a correspondent has lately raised a point of great public importance. He states that, where persons have recently died from tuberculosis, the agents of life insurance companies or societies are, in some cases, calling at the office of the local public health department or tuberculosis clinic and asking for information as to the date on which their disease was notified. When this information has been refused, there has been a renewed request, accompanied by the statement that such information is given quite readily in other towns. As the writer of the letter justly observes, there is no desire to connive at the malpractices of persons who make fraudulent declarations on entering insurance; but, unless a cynical view is taken of the word "confidential," it is a duty to refuse to give the details asked for, except under the protection of the courts.

Article II. of the Public Health (Venereal Diseases) Regulations, 1916, contained the express direction, reinforced by a departmental circular, that "all information obtained in regard to any person treated under a scheme approved in pursuance of this Article shall be regarded as confidential." The Public Health (Tuberculosis) Regulations of 1930 do not contain a similar stipulation, but they leave no doubt that secrecy is to be observed. Like previous Regulations for the notification of infectious disease, they require the notification to be enclosed in a sealed envelope; this requirement, it is added, will b sufficiently complied with if the notification is folded and sealed "in such a manner that during its transmission the particulars of the notification cannot b observed." Why this precaution if on arrival th communication may be divulged to anyone who asks Insurance companies are entitled to full disclosure *information affecting the contract of insurance* but the duty is owed only by the person with whom th contract is being, or has been, made; the officer of public health department is in no way the agent representative of an insured person for the purpo of being affected by this duty. The whole system notification of infectious diseases is a statutory brea of the medical rule of secrecy; the relaxation of t rule is strictly limited to the statutory requiremen the fact that a patient suffers from a notifiable dise does not mean that thenceforth there is no furtl duty of secrecy. If the Ministry of Health reali the danger which our contemporary's correspond has revealed, it will doubtless take steps to make cl *that notification is at all stages a* confidential mat

Alleged Negligence: Another Plaintiff Withdraws.

In Tudor *v.* Mein, discussed in these colu *last week, an allegation of professional* neglige launched against a surgeon, was withdrawn a hearing the evidence of the defendant and tw his expert witnesses. A somewhat similar settlen of litigation, on learning what could be said on other side, occurred at about the same date in Supreme Court of Northern Ireland. A schoo at Campbell College, Belfast, had been inj accidentally by a blow from a spade while hel to level the school football field. The injury followed by septic poisoning. Treatment pr difficult; it was said that the boy had been atte by 35 doctors, had undergone 26 operations, and been five years on his back and was not well The boy and his father brought an action for dam against the governing body of the school for all negligence. After the plaintiffs' case had opened and Sir Thomas Houston had given evid in support of it, the evidence of a second wi was interrupted by counsel announcing tha settlement had been reached. Allegations of n gence against the matron (who had treated the injuries) and the headmaster respecting the ge conduct of the school were withdrawn, and defendants agreed to make a payment to the and his father as part of the settlement.

In Tudor *v.* Mein the revelation that there two sides to the case and that the defendant h satisfactory answer to the allegations of neglig occurred after hearing the defendant himself. I Belfast case the revelation came earlier through defendants' counsel allowing the plaintiffs' co to read the proofs of the medical and other witn who would have given evidence for the defend The same question suggests itself as in Tudor *v.* why cannot means be found to convince plai at a still earlier stage that there is an adequate an on the defendants' behalf? A great deal of money, and anxiety would be saved if such a disco could be made before the briefs are delivered counsel can satisfy one another by a mutual discl of facts and opinions without leaving the decisi

CORRESPONDENCE

MEDICAL PATENTS.

To the Editor of THE LANCET.

SIR,—I read with interest the leading article on he Law of Medical Patents in your last issue. It eems to me that the issues at stake are of national mportance, and should not be left to vested interests r Government departments to determine. Research orkers who are in receipt of salaries or scholarships, r who are employed on a whole or part-time basis, re in a category of their own, and are surely not ntitled to exploit any discoveries they may make r their own benefit. The benefit of their inventions hould logically be vested in those who have provided he means for their discovery.

The position of the private or independent research orker is different. He has to bear the whole cost f his work, and is in an unfavourable position should e make a discovery which is patentable. To deny im such rights would be to hinder valuable research, r alternatively to drive such successful inventors o seek patent protection for their inventions in some oreign country first, afterwards obtaining similar rotection in the United Kingdom through the onvention. This could not be prevented except in he unlikely event of unanimous international agreement upon the subject of medical patents.

My own case may throw some sidelights upon the question. A good many years ago I was investigating the effect of ultra-violet radiation not only upon the human subject but also upon foodstuffs and other substances. I had previously come to the conclusion that the value of "food" depends not o much upon its quantity or "calorific" content as upon the presence of "living substances"—the so-called vitamins. It seemed to me that the enormous importation of "preserved" food into this country was leading to a steady deterioration of the physique of the race, a deterioration which was naturally most felt amongst the masses of the people. The results of my researches led to several discoveries which I made no attempt to patent or keep secret. Whilst I, *at my own expense*, was testing the effect of certain of these preparations in the out-patient department of a London hospital, I was approached by a representative of a firm which had purchased the patent rights in this country of the Steenbock invention to test their preparations. My feelings may be well imagined, particularly as my own preparations proved clinically superior to those of the firm in question. These conclusions were independently verified by a number of qualified clinical assistants working with me.

Some years later I mentioned this matter in conversation, and was urged to try to obtain a patent even at this late stage. I did so, and was granted protection last December (British Letters Patent, "Treatment of Yeast," No. 354371). The Steenbock patent however, being so wide and comprehensive in its claims, is regarded by many as a "master patent."

The effect of my patent would be that, if commercially exploited, substances containing vitamins B1, B2, and D could be made and sold at such a price as would place them within the reach of every man, woman, and child in this country who needed them. But up to the present no firm has shown the intention either to benefit themselves, the nation, or the inventor, as they appear to be in awe of the Steenbock patentees. I have been informed by more than one person who could speak with authority that the Steenbock patent might not survive the acid test of the English law courts, but that no one would care to oppose the patent in such a manner because the rights are held by a University!

One is almost forced to the conclusion, Sir, that much of this talk about medical patents is unpractical, and does not offer any real solution of the actual problems. These problems are surely national, and demand the attention of statesmen.

I am, Sir, yours faithfully,
PERCY HALL.

Gloucester-place, W., March 14th, 1932.

To the Editor of THE LANCET.

SIR,—In the discussions surrounding the application of the patent laws to medical discoveries it is essential not to lose sight of certain fundamental principles: (1) It is less important to prevent a doctor making anything out of a process which he has invented than to make sure that patients are protected from spurious remedies. (2) If there is a chance of making money out of a thing people will make it despite any form of legislation or regulation or ethical convention. (3) If a man has devoted a great deal of his life, and perhaps some of his money, to the development of a process, even though it be for the relief of sickness, he is going to make whatever he can out of it. (4) A manufacturer is not going to put down expensive plant, employ trained men, and pay for publicity unless he can be guaranteed protection; in other words, he will not really make an effort to market a product unless it is patented. Most sensible people agree with these points when speaking in camera. The doctor admittedly works primarily for the relief of sickness and suffering, but it is merely cant to pretend that he is concerned only in the very far background of his mind with thought of his daily bread and butter and with the upkeep of his home and the education of his children.—I am, Sir, yours faithfully,

March 15th, 1932. GENERAL PRACTITIONER.

ARTERIAL ATONY AND ARTERIO-SCLEROSIS.

To the Editor of THE LANCET.

SIR,—I should like, if I may, to reply briefly to Dr. A. Abrahams, writing in your issue of Feb. 27th (page 480), who, unlike your annotator, has failed to understand me aright; for by the term "athletes" I understand persons of constitutionally large size who make the topmost physical achievements, requiring not only single muscle groups, but the whole bodily musculature. Not in the remotest degree did I wish to bring arterio-sclerosis into ætiological relation with the ordinary gymnastic exercises or the moderate activity in sport which is so important for everyday health. If Dr. Abrahams reads this into my article I think he does me wrong. I will gladly admit that I expressed myself in my original work too shortly for Dr. Abrahams, and I see myself obliged to prove with some figures that excessive bodily work is an important ætiological factor in the occurrence of arterio-sclerosis.

For instance, I find in the statistical tables of Braun[1] percentages of raised mortality up to 267 before the law. This means that the law, in its present form, is inadequate and non-executable. The law means well, but results are disappointing.

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[1] Blätter fur Versicherungsmathematik und verwandte Gebiete 1910, Part 8.

SCOTLAND.

(FROM OUR OWN CORRESPONDENT.)

ROYAL VICTORIA HOSPITAL TUBERCULOSIS TRUST.

THE forty-fourth report of the Trust contains legitimate expressions of satisfaction that the Trust was directly inspired by the discovery of the tubercle bacillus some 50 years ago. It is common knowledge that Sir Robert Philip studied tuberculosis at that date in Vienna, bringing back to Edinburgh an enthusiasm for the investigation and treatment of tuberculosis that has never wavered. Step by step, the group of institutions for which the Tuberculosis Trust is responsible came into existence and had a notable effect in developing the tuberculosis policy of this country. In a recent appreciation contributed to the *Zeitschrift fur Tuberkulose* (Berlin) Sir Robert Philip says that all that has been attempted in Edinburgh, in relation to the problem, was inspired by the stimulus produced by the completeness and the beauty of Koch's demonstration. It was the realisation of the extent of the damage wrought by the bacillus which led to the foundation at Edinburgh of the Tuberculosis Dispensary (1887) as a receiving house and intelligence centre where information would be received and guidance given concerning the disease. Thereafter came the establishment of the Sanatorium (1894) followed immediately by the School for Tuberculous Children (1895), the opening of a pavilion for advanced consumptives by the municipality (1906), the inauguration of the Farm Colony for more continuous care (1910), the provision of a classroom and laboratory for the teaching of medical students and doctors (1912), the establishment of the chair of tuberculosis in the University of Edinburgh (1917), the opening of the Sanatorium Colony, Southfield (1922), and the establishment of a tubercle-free herd of cattle (1923).

EDINBURGH ORTHOPÆDIC CLINIC.

In January, 1931, a clinic which had been formed in 1926 was formally constituted as an independent body, to be called the Edinburgh Orthopædic Clinic. The object of the clinic is to provide massage, medical gymnastics, medical electricity, and ultra-violet ray treatment for people of limited means at moderate fees. At the first annual meeting of contributors to the clinic, Miss Gertrude Herzfeld, F.R.C.S.E., presiding, it was stated that during 1931 258 patients had been admitted and 36 patients readmitted; 5899 treatments had been given, compared with 5909 treatments during the previous year. On the actual working of the clinic for the past year there was a deficit of £98; but as the revenue accruing amounted to £140, the capital fund had been increased by £41. The clinic had been approved by the Department of Health for Scotland as a charitable institution and patients insured under the National Health Insurance Scheme might now obtain benefit through their approved societies. Mr. William A. Cochrane stated that it was an up-to-date clinic and contained everything required for remedying physical defects by these special means. It was so popular now that it had a waiting-list and the work done was of the first order. An interesting feature was the home service provided by the clinic. Cripples are well served in Edinburgh. The Rev. Ratcliffe Barnett, who has taken a keen interest in promoting the new Cripple Children's Hospital at Fairmilehead, on returning from the war, started a club here for men and lads who were permanently crippled, and it is still flourishing.

CHIROPODY IN EDINBURGH.

At the annual meeting of the Incorporated Society of Chiropodists, Dr. Craig, who succeeded Dr. Drever as Scottish Medical Secretary of the British Medical Association, referred to the excellent work done by the Edinburgh Foot Clinic. During last year they had treated over 8000 people, and there was a waiting-list of 1600. The clinic made a small charge to all patients who were in a position to pay, while treating free those not able to pay. Dr. Craig thought the general public had little idea of the mass of suffering that resulted from the kinds of foot troubles which the clinic was able to treat, and praised the good work being done there.

IRELAND.

(FROM OUR OWN CORRESPONDENT.)

THE NEW GOVERNMENT.

THE post in the Government of the Irish Free State which is of most importance to the medical profession is that of Minister for Local Government and Public Health. It is satisfactory that this office has been given to one who has considerable experience of the problems of local government, Mr. Sean T. O'Kelly, who was for many years a member of the Dublin Corporation. It is rumoured that he may have the assistance of one of the medical deputies as Parliamentary Secretary. A medical man, Dr. James Ryan, has been appointed Minister for Agriculture.

SWEEPSTAKE MONEY FOR MEDICAL RESEARCH.

In a letter to the *Irish Times* of March 12th, Dr. Henry Moore, professor of medicine in University College, Dublin, repeats a suggestion made by him more than a year ago at a meeting of the Dublin University Biological Association. He is concerned with the lack of provision for medical research i Ireland, and he suggests that a small percentage o the fruits of the Hospital Sweepstakes might b earmarked for this purpose. He states that a capita sum of, say, £200,000, would provide a fund adequat for the financing of medical research, and that suc a sum would quickly be accumulated from even small percentage of the moneys at present bein devoted to the hospitals. He enumerates a few o the advances in medicine due in recent years t medical research, notably in the treatment of diabete and of pernicious anæmia, and suggests that expenditure on research might give results of more permanen benefit than even the improvement of the hospitals Following on Prof. Moore's letters Dr. T. P. C Kirkpatrick, general secretary of the Royal Academy of Medicine in Ireland, writes to the same journa (March 14th) to state that the General Council o that body had prepared a scheme on the line suggested by Dr. Moore, and were only awaiting suitable opportunity to place it before the Ministe for Justice, under whose control the Hospita Sweepstakes are conducted.

The sum received for tickets in the Grand Nationa Hospital Sweepstake which were drawn this wee was stated to be £3,365,312, of which £2,239,477 wil be distributed in prizes, and £841,328 be available fo the hospitals. This is an advance in the sum for the hospitals of almost £100,000 beyond that from the Sweepstake on the Manchester November Handicap, 1931.

travenous puncture. Apart from the possibility acquired immunity and sensitiveness it will be ted that there are (as with other poisons and fections) wide variations in the degree of the imary or constitutional susceptibility.

I am, Sir, yours faithfully,
J. A. RYLE.

Wimpole-street, W., March 14th, 1932.

BCG VACCINE.

To the Editor of THE LANCET.

SIR,—In your issue of Feb. 20th (p. 422) Prof. S. de Cummins has published a noble and highly ientific letter on B C G, and henceforth your readers n judge the exact value of preventive vaccination ainst tuberculosis, as it is done in France and in any other countries.

Nevertheless it seems necessary to put right certain posite arguments, invoked by Dr. W. M. Crofton a letter immediately following that of Prof. mmins. Dr. Crofton says: "It does not seem to e that any reasonable person can think the B C G ethod a desirable way to immunise human beings ainst tuberculosis." He fears the use of living cilli and prefers killed antigens. If he had himself udied these as I (and many others) have done for 30 ars, he would know that dead antigens, bacilli or cillary products, do not immunise. As for the nger of using living bacilli there is none when one es B C G, for those who studied it seriously all now that it is innocuous. It should not be forgotten at only *living* vaccines such as Jenner's small-pox mph, and Pasteur's vaccines against rabies, anthrax, al-septicæmia, yield solid and durable immunity. he *dead* vaccines used against typhoid fever, cholera, c., can only immunise for a short time and very imperfectly.

How is it possible for a reasonable person not to nderstand that it is better to immunise children mediately after birth against tuberculosis by the pregnation of their organism with surely innocuous nd permanently effective bacilli, than to wait for em to be immunised by an accidental virulent fection which may turn into a deadly illness any ay of their lives?

I am, Sir, yours faithfully,
Dr. A. CALMETTE.

Pasteur Institut, Paris, March 9th, 1932.

TUBERCULOSIS OF CHILDHOOD.

To the Editor of THE LANCET.

SIR,—I should like to thank Drs. Toussaint and MacIntyre for their very able and practical comments on Dr. Fletcher's paper, and I should like to endorse these. Dr. Kerley, however, appears to consider that they have not appreciated sufficiently recent advances in radiological technique. But has this improvement really enabled us to discover with any degree of certainty the nature of every pathological lesion in the chest which throws a shadow on the screen or plate? I think that those with a wide clinical as well as radiological experience will answer that it has not. Many of the "pneumonic conditions" in children described are either tuberculous or epituberculous in nature, with Koch's bacillus as a primary or as a secondary infecting agent, but many are not. The differential diagnosis is often very difficult, impossible usually by radiology, and only to be established on the history or the absence in the history of lassitude, failure to gain weight, and occasional slight pyrexia. The slight pyrexia, it should be added, may only be discovered on admitting the child to hospital for diagnosis. But do all cases end in complete resolution or calcification? Do not some end in bronchiectasis and in chronic non-tuberculous pulmonary fibrosis? Of those that resolve eventually some may have been non-tuberculous, and judging by the rarity of the radiological discovery of basal calcareous shadows in adult skiagrams only a few pass on to calcification. Are we even sure that no organism except the tubercle bacillus can produce such a lesion?

In your last issue (p. 597) you quote Dr. William Munro, of the Glenlomond Sanatorium, as saying, "London observers do not appear to regard pulmonary tuberculosis as a late manifestation of a childhood infection. They are wrong and far wrong. The facts are all against them." Surely this is a very sweeping statement to make. Those of us who consider that most adult pulmonary tuberculosis, especially the more acute type so prevalent among young adults, represents a recent primary or a new infection may be wrong, but the facts are certainly not all against us. Of all the evidence which Dr. Munro seems to disregard I think the most important is that of the investigations into the health of 581 probationer nurses by Heimbeck—4 out of 282 tuberculin-positives and 67 out of 299 tuberculin-negatives developed pulmonary tuberculosis during their hospital training.

I am, Sir, yours faithfully,
C. O. S. BLYTH BROOKE.
Chief Tuberculosis Medical Officer, Antrim County Council.

Belfast, March 14th, 1932.

To the Editor of THE LANCET.

SIR,—In their reference to my paper on pre-symptomatic tuberculosis in childhood Drs. Toussaint and MacIntyre raise some interesting points. The diagnosis of enlarged tracheo-bronchial glands in children is of the utmost importance, as the condition is invariably of tuberculous origin. Efforts have been made by workers in all parts of the world to make the diagnosis clinically, but as I have said, "the number of correct diagnoses is small." A good many cases are also missed radiologically, because the X ray does not show these glands until they are comparatively very large and generally caseous. But if the X ray does show them, the diagnosis is clinched, as the appearances are unmistakable. Dr. Kerley puts the position plainly. But there still seems to be a great many people who are referring to branches of the pulmonary artery as "glands" in X ray films.

There is only one important gland which anatomically could be represented at the site of the hilar shadow, and that is the large broncho-pulmonary gland. This is never seen unless it is calcified—i.e., healed. In cases of non-tuberculous lung infection, this gland is very often enormously increased in size, but no shadow is cast by the X ray. The only glands which are identified by the X ray in the pre-calcification stage are the tracheo-bronchial and para-tracheal groups.

The question of the tuberculin test is a much more difficult one. The recent report of the Medical Research Council goes into it fully and the conclusions are conservative. Although it is generally accepted that tuberculin does not sensitise to itself, I have found that children who are non-reactors to-day may be reactors to the *same* dose of tuberculin in a for those engaged in heavy work, such as copper-mining, in contrast with 0 for chauffeurs, 45 for cooks, and 35 for electro-technicians. North American statistics [2] show that big persons of excessive weight, and height of 185 cm. plus, show a greater mortality than smaller persons. And Hörnig [3] is of opinion that especially big powerful overweight persons, among whom athletes are to be included, show a higher mortality than normal persons. Braun [4] found an excess mortality of 50 per cent. for stage acrobats. Dr. Dublin of the Metropolitan Life Insurance Company has examined mortality and morbidity from heart disease among people who engaged in sport in their youth. The mortality varies much among the various sports and is greatest in baseball players and oarsmen. The mortality is 8 per cent. higher than among the usual insured population and 12 per cent. higher than among average sportsmen. What is most striking is that of those over 45 years 32 per cent. died of heart disease, whereas in insured persons the proportion is seldom more than 20 per cent. On the average those who in their youth as students have done some sort of sport live somewhat longer than other insured persons. That can only be explained by assuming that the average insured person has enjoyed a less happy youth than the student. But quite apart from this, it gives food for thought that those who have gone in for sport are appreciably more damaged in their cardiac efficiency than those who have not indulged excessively in sport.

As far as the blood pressure is concerned, the sharp rise of maximal blood pressure during work is certainly not without its effect on the vessels, but for the work of the heart it is not so much a question of maximal blood pressure as of the *pression efficace* in Potain's sense. Astel and Grosse [5] were able to establish a constant rise of minimal blood pressure, and of course also of the *pression efficace*, even during a three months' course of training. I believe that the results which have been obtained from a vast array of figures carry more weight than the few old Marathon runners who are remembered just because they are exceptional.—I am, Sir, yours faithfully,

Berlin, March 10th, 1932. JOH. PLESCH.

RESEARCH IN ASTHMA.

THE URINARY PROTEOSE.

To the Editor of THE LANCET.

SIR,—Dr. Freeman has on two occasions published statements[6] about a visit that he paid at my invitation to Guy's Hospital in order that we might together investigate the skin reactions of the proteose. Personally I should have thought that the results of such a visit should either have been regarded as confidential like the proceedings of the Asthma Research Club, of which he is honorary secretary, or if publication was desired a combined report of the results by those taking part in the test should have been written, or at any rate my permission should have been obtained before publication; this latter was not done.

Let me say that in his original communication I have not much objection to his statement of the result of the test, though it might have been more complete and the case I showed him was not specially "selected" as he presumes. His rhetorical flourishes, though highly coloured, were on the whole harmless;
but his last description of the visit certainly requires
some counter-statement, since he says that he saw
at Guy's Hospital that very small differences were
being taken to indicate a reaction, and he comments
on "the apparent lack of caution with which these
possibly chance differences were being interpreted."
I feel it only fair to Dr. Bruce Pearson, who is makin
a careful investigation of the whole subject b
injecting active and control proteose into asthmati
patients and normal subjects, to combat this state
ment. In the last number of THE LANCET ther
appears (p. 571) a short report of Dr. Pearson'
paper to the Therapeutic and Pharmacologic
Section of the Royal Society of Medicine in whic
he gives the criteria of a reaction and the conclusio
so far reached are briefly stated.

I should also like to refer to Dr. Oriel's demonstr
tion before the meeting (not noted in your column
at which five patients and two normal controls we
injected with (1) an active proteose from an asthmat
case; (2) van Leeuwen's extract of human dandru
and (3) a proteose solution from a normal patie
All who attended the demonstration noted that w
the asthmatic patient the asthmatic proteose and t
human dandruff gave positive results, whereas t
proteose controls were normal, while in the norm
subjects all three substances gave negative resul
No doubt the reactions to the proteose are not
marked as reactions to pollen, and strong soluti
of the proteose are apt to give tests in normal peo
as well as allergics. Possibly Dr. Freeman in
paper was using too high a strength of prote
solution so that nearly all his results were positive

I am, Sir, yours faithfully,

E. P. POULTON

Upper Wimpole-street, W., March 12th, 1932.

ANAPHYLAXIS FROM BEE-STINGS.

To the Editor of THE LANCET.

SIR,—In his interesting letter on this subj
Dr. A. L. Gregg remarks that we have as yet
adequate explanation for the sudden loss of immun
to bee-stings which may occur even in veteran
keepers. I had occasion to seek an explanat
last summer when my wife, after handling bees
two or three seasons and sustaining only local reacti
of moderate severity, had the following uncomfort
experience. One day a solitary bee stung her on
scalp. Within a few seconds her eyes began
itch and she had a sensation of swelling in the
lids and the ears. This was followed by a n
unpleasant feeling of constriction in the chest
a little later by generalised urticaria. She ha
soda bath and rested and within five hours
completely recovered. We were naturally anxi
to understand the significance of this reaction
to know what was likely to happen on the n
occasion. I put the problem to my friend, Dr. P.
Laidlaw, who made the ingenious and, I beli
appropriate suggestion that the bee had administe
an intravenous sting. In support of this my
recollected clearly that there had been no l
reaction at the point of puncture. She has since b
stung with an ordinary local response. May it
be that these occasional and alarming anaphyla
seizures in persons usually immune or reacting i
local way only are due to intravenous stings? Perh
the question of "dosage" should also be consider
for the simultaneous administration of many cutane
stings might produce the same effect as a sin

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[2] Hunter: Trans. Act. Soc. Amer., 1913, vol. xii.

[3] Handbuch der ärztlichen Begutachtung, 1931.

[4] Neumanns Zeitschrift fur Versicherungswesen, No. 49, 1926.

[5] Leibesübungen, Year 1930.

[6] THE LANCET, Dec. 12th, 1931, p. 1323, and March 12th, 1932, p. 562.

PUBLIC HEALTH SERVICES

A TUBERCULOSIS AUDIT.

THE Ministry of Health has issued[1] an important port on tuberculosis written by Dr. A. Salusbury cNalty, in the prefatory note to which Sir George wman likens the Ministry's annual reports to e yearly audits of business corporations. The tlay on maintaining residential institutions for e treatment of tuberculosis, we are told, amounts 2½ million pounds, exclusive of the cost of treating ose tuberculous patients who are in public assistance spitals. And this figure takes no account of the ntrol of milk-supply, the maintenance of the spensaries, and other sides of anti-tuberculosis rk. Is the nation receiving an adequate return r such expenditure? At a time of national financial ress like the present, it is, Sir George points out, ore than ever important to know the answer to this estion. Dr. MacNalty's report contributes to this owledge. Beginning with the prevalence of tuberlosis in this country, he states that the number of aths from all forms of tuberculosis has fallen om 58,930 in the year 1901 to 37,990 in 1929. he existence of the three peaks of mortality—ung adult, middle age, and old age—foreshadowed y Brownlee in 1918 are shown to have now become fficiently marked to be demonstrable in the graphs ven in the report. One of the most puzzling atures in the statistical records of tuberculosis in ngland and Wales is the peak of mortality for the oung adult woman. The rate of decline in mortality as increased for both sexes in the middle age and ld age groups, and also in the young adult male roup, but the decline in mortality amongst the oung adult women has practically ceased. The ortality in this group is stationary at the same level s in the early days of the century. The report uggests that a secondary cause is acting at this age which is independent of the tubercle bacillus. This eems highly probable. The whole clinical picture points to the soil rather than the seed, and every phthisiologist must be seriously concerned with our failure to reduce the mortality in this group. There are not wanting signs however that the outlook for this type of case is better than it was. Earlier diagnosis is being effected and there is probably no class of case that so well repays sanatorium treatment.

On the sanatorium system in general Dr. MacNalty has assembled data from various British sources which should give a reasoned answer to those who condemn the system as wasteful and extravagant. It is not that the sanatorium system has been at fault during the last 30 years but that there has been such confusion of ideas in carrying it out. As Dr. MacNalty points out, widely different policies in selecting cases, in classifying them, in maintaining them for long or short periods, in recording results and other cognate matters of procedure, have in the past created a muddle which is only just beginning to get straightened out. In this respect we are glad to see the good results of Frimley Sanatorium stressed. The practice adopted at this institution of admitting only such cases as have been through a preliminary period of observation at the Brompton Hospital is one which public authorities might adopt with profit. Another point which should be stressed is the length of stay in the sanatorium. A discerning colleague from overseas after examining closely our English system recently expressed the view that the weakest point in our system was the shortness of the stay in the sanatorium. We are of course hard pressed to reconcile public purse and private good, but sooner or later this question will demand a solution in view of the statistics of immediate and remote results which the sanatoriums are now providing.

Our last comment on Dr. MacNalty's admirable report concerns the examination of contacts, for he was led to make searching inquiry into the system, by the expression of an opinion three years ago in these columns[2] that the examination of child contacts as usually conducted in the dispensary was futile. Since that date statistics for various county areas —e.g., Lancashire, Worcestershire, Devon—and for hospitals such as Brompton, have been published which show that the tuberculosis death-rate amongst contacts is considerably greater than amongst the general population, and we readily admit that the Ministry have made a good case for regarding properly conducted contact examinations as a valuable part of the tuberculosis officer's work. It is not contact examination per se which is futile, it is the lack of perspective so often applied to it which is to be deplored. Such inquiries as are cited in the report have their place and we trust that their scope will be extended, but we should be sorry to see the tuberculosis officer rendered ineffective by sheer weight of numbers, and his clinical interest blunted by routine, all too often of a purely statistical nature. No inconsiderable proportion of juvenile tuberculosis is due to the bovine bacillus and the primary case is to be sought for in the byre rather than in the home. The need at the moment would seem to be a clear statement on the contact problem, what constitutes a "contact," how long does he remain so, on what standard of positive diagnosis shall he be judged—radiogram, or intradermal tuberculin test, or stethoscope—which portion of the contact class is the most important to infants, school-children, or adolescents. These are not quibbles. All cases of tuberculosis are contacts. With the resources at our disposal concentration on the immediately urgent danger points are essential and we must know where they are. Separating out into one group those in whom definite house contact can be established and lumping all the rest with the general population has undoubtedly brought out statistically the importance of home infection, but we are inclined to think there is a danger of obscuring certain other issues such as bovine tuberculosis and factory and workshop infection.

Between the ages of 5 and 45 tuberculosis is still, as Dr. MacNalty puts it, the chief killing disease, and no one can contemplate the curves facing p. 7 without pausing to consider. We have much to congratulate ourselves upon, and the report, considered as an audit, is a document of great merit. But the closing of the account is not yet in sight.

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[1] A Report on Tuberculosis, including an Examination of the Results of Sanatorium Treatment. By Arthur Salusbury MacNalty, M.A., M.D., F.R.C.P., Senior Medical Officer for Tuberculosis, Ministry of Health. Reports on Public Health and Medical Subjects: No. 64. H. M. Stationery Office. 1932. Pp. 172. 3s.

[2] See THE LANCET, 1929, i., 1201.

ST. JOHN'S HOSPITAL, TWICKENHAM.—Recently the Princess Royal opened new wards at St. John's Hospital, Twickenham, and unveiled two memorial tablets. The cost has been £6000, of which only £100 remains to be raised.

few days time. Dr. D'Arcy Hart mentions this in his report, and says that he found the percentage of error to be 5·5 per cent. in a small series. Such anomalies as these make one distrust the test in practice, and it seems that judgment should be reserved until more work has been done on the protein and non-protein fractions of tuberculin. The fact that the tuberculin reaction is not an antigen-antibody phenomenon, but an example of true allergy makes its interpretation difficult.

Drs. Toussaint and MacIntyre do not agree with the conclusion I reached on the question of contacts, and in support of their contention quote cases of miliary and meningeal tuberculosis, and cases of sputum-positive pulmonary tuberculosis in children. The comparability of their cases to mine, and the relationship of mass infection to generalised tuberculosis, is too big a subject to discuss here. In 1000 school-children examined by Barnard, Amberson, Jr., and Loew, in New York, 184 children were found [1] with tuberculous pulmonary lesions demonstrable by X ray; out of these, only eight had a certain history of contact, and a further nine a probable history of contact. This work was quoted in my paper.

I am, Sir, yours faithfully,

ERNEST FLETCHER.

Harley-street, W., March 15th, 1932.

MUCOUS FEVER.

To the Editor of THE LANCET.

SIR,—In your report of what Prof. Storm van Leeuwen said at the discussion on Desensitisation in Allergic Disease (THE LANCET, March 12th, p. 571) reference is made to "Schlamm" fever, "which he translated as *slime* fever." I understood him to say "Schleimfieber," and as the German word "Schleim" means mucus, the English translation would be "mucous fever," which is given in the New Sydenham Society's medical lexicon under *febris mucosa*. However, on looking up "Schleimfieber" in a German *Conversations-Lexikon* of 1886, I find it stated that this "febris mucosa" was a term formerly used for any one of several febrile disorders in which much mucus was secreted, but that "modern medicine" (at that time) had given up the term completely. Evidently "modern medicine" (at the present time) has taken up the term again to signify some particular, not very dangerous, febrile specific infectious disease. Does it exist in England?

I am, Sir, yours faithfully,

London, W., March 12th, 1932. F. PARKES WEBER.

*** According to W. Guttmann's "Medizinische Terminologie" (1923) *Schlamm-fieber* is an epidemic febrile disease, usually of benign course, attended with a measly rash and enlargement of spleen and liver, occurring after prolonged residence on marshy soil or the drinking of bad water. Its exacter ætiology was then unknown.—ED. L.

HÆMORRHAGIC PURPURA FOLLOWING SCARLET FEVER.

To the Editor of THE LANCET.

SIR,—The two cases of hæmorrhagic purpura reported by Dr. Gibson and Dr. Hobson in your issue of March 5th are so curious as to suggest the question whether the hæmorrhages were in fact due to scarlatinal toxin. It would be instructive to know whether hæmolytic streptococci were found and, if so, of what type. Some of the clinical features are more characteristic of a diphtheritic infection. If the infection was a hæmolytic streptococcal one, the cases lend point to the opinion that I have expressed elsewhere that even mild cases of scarlet fever should not have antiscarlatinal serum withheld from them, since even mild cases may have severe toxic complications. The ease with which desensitisation may generally be effected rules out the risk of severe protein shock.

I am, Sir, yours faithfully,

A. H. G. BURTON.

Public Health Offices, Ilford, March 10th, 1932.

INFECTIOUS DISEASE
IN ENGLAND AND WALES DURING THE WEEK ENDED MARCH 5TH, 1932.

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 42 (last week 72); scarlet fever, 1482; diphtheria, 886; enteric fever, 36; pneumonia, 2064; puerperal fever, 43; puerperal pyrexia, 106; cerebro-spinal fever, 67; acute poliomyelitis, 3; acute polio-encephalitis, 2; encephalitis lethargica, 12; dysentery, 39; ophthalmia neonatorum, 118. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on March 8th–9th was as follows: Small-pox 101 under treatment, 7 under observation (last week 116 and 2 respectively); scarlet fever, 1344; diphtheria, 1565; enteric fever, 12; measles, 1810; whooping-cough, 392; puerperal fever, 19 (plus 6 babies); encephalitics lethargica, 227; poliomyelitis, 3; "othe diseases," 191. At St. Margaret's Hospital there were 1 babies (plus 9 mothers) with ophthalmia neonatorum.

Deaths.—In 117 great towns, including London there was no death from *small-pox or* enteric fever 76 (24) from measles, 8 (2) from scarlet fever, 36 (4 from whooping-cough, 36 (6) from diphtheria, 52 (12 from diarrhœa and enteritis under two years, an 298 (47) from influenza. The figures in parenthese are those for London itself.

The reported deaths from influenza are again on the dow grade. Of the great towns *Leicester* stands highest wi 15 deaths, followed by Sheffield with 14 deaths and Birmin ham with 11 deaths. The total deaths for the year fro influenza so far amount to 2937 compared with 3093 f the corresponding period of 1931. The 1932 record is no better than that of the preceding year. Liverpool report 5 deaths from measles, Willesden and Manchester each Liverpool and Birmingham each reported 4 deaths fro whooping-cough. Diphtheria claimed 4 victims in ea of Hull, Leeds, and Liverpool.

The number of stillbirths notified during the week wa 301 (corresponding to a rate of 45 per 1000 births including 41 in London.

PROVISIONAL DEATH-RATES FOR 1931.

Provisional death-rates per 1,000,000 populatio for England and Wales during the year 1931 are no available as follows:—

	Males.	Females.	Perso
Respiratory tuberculosis	872	622	742
Other tuberculosis	169	140	154
Cancer	1,450	1,516	1,484

The maternal mortality (*provisional*) based deaths primarily classed to puerperal conditions as follows:—

Puerperal sepsis per 1000 live births, 1·66; per 10 total births, 1·59.

Other accidents and diseases of pregnancy and parturiti per 1000 live births, 2·45; per 1000 total births, 2·35.

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[1] Amer. Rev. Tuberc., 1931, xxiii., 593.

[1] The heading Enteric Fever in this column of the Return h now been amplified so as to make it quite clear that it includ Typhoid and Paratyphoid Fevers.

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To the brief note on the adventurous career o Colonel Reynolds in our last issue Mr. W. G. Spencer, consulting surgeon to the Westminster Hospital, adds the following reminiscences: "Whilst Col Reynolds was in charge of the Pimlico Clothing Department he was accustomed to send work women to me at the hospital, and later he came t me about his health, the last time at the beginning of 1929. Then a growth for which a grave operation would otherwise have been called for disappeared i about ten days under radium. Col. Reynolds wa thus able to walk at the head of the V.C.'s at th thanksgiving ceremony, and to be present at th dinner in the House of Lords. Our conversation often returned to Rorke's Drift, and from notes jotted down I pick out a few of his reminiscenc which I have not noticed in the general story.

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Water-supplies in Rural Areas.

. Rosbotham asked the Minister of Health if his ition had been drawn to the fact that many rural hes were in need of public water-supplies; and if ould consider taking steps as early as possible to make al grants to rural district councils to enable them to dy the conditions under which many of the inhabitants ined their daily supplies.—Sir E. Hilton Young ed: I am aware of the inadequacy of the water-supply me rural parishes. Conditions generally have improved cent years, loans amounting to £2,000,000 in respect ral schems having been sanctioned by my department ng the last three years. As regards the second part of question, I cannot hold out any hope of special assistance g available from the Exchequer, but I may point out it is open to county councils to contribute to the cost hemes.

Vaccination and Encephalitis.

r Groves asked the Minister of Health whether any ges had been made in the methods of manufacturing ine lymph in the Government lymph establishment, a view to the prevention of the risk of post-vaccinal phalitis; and whether the changes, if any, included the ndonment of the use of rabbits for the purpose of ngthening the lymph supplies.—Sir E. Hilton Young ied: This question has been fully considered, and no change has been made or is contemplated I am advised there is no evidence to suggest that the use of rabbits the preparation of lymph has any influence on the rrence of post-vaccinal encephalitis.

eague of Nations and Statistics of Small-pox.

r Groves asked the Minister of Health whether he ld consider the advisability of making representations he League of Nations health committee in regard to the r in which statistics of small-pox cases were set forth their periodical Reports, in view of the fact that no rimination was made in the Reports between the mild l almost non fatal variety of small-pox, known as alastrim, ich had been recently prevalent in England, and the ere or classical type which was prevalent for the most part where—Sir E. Hilton Young replied: Distinctions ween the two varieties of small-pox appear in the latest these Reports which deal with epidemics of this disease e Reports are issued solely on the responsibility of the alth section of the Secretariat of the League of Nations l specifically stated in each Report that the responsibility the Health Committee of the League is not involved.

Dead Bodies Recovered from the Thames.

Mr. Cocks asked the Home Secretary how many dead dies were taken from the Thames for the year ended h 29th, 1932; and what were the verdicts recorded at inquests.—Sir Herbert Samuel replied: I can only ve figures for the City of London and Metropolitan police strict, as follows. The number of bodies was 158 and the rdicts at the inquests were: found drowned and open rdict, 56; suicide, 46; accident or misadventure, 39; illborn or want of attention at birth, 15; murder (newly-orn), 1; cause not known, 1.

Murder Statistics for England and Wales.

Mr Cocks asked the Home Secretary if he would state ow many murders were known to the police in England and ales during the years 1930 and 1931, respectively; in ow many cases the supposed murderer committed suicide; ow many persons were proceeded against for murder; ow many of such persons were found to be insane before al or on arraignment, or guilty but insane; how many of ch persons were convicted of murder excluding those found ilty but insane; and how many of those convicted of rder were subsequently executed.—Sir Herbert Samuel plied: The full details desired are not yet available for 931. In 1930, 108 murders were known to the police, volving 119 victims, of whom 22 were newly-born infants ose bodies were found in such circumstances as to afford o clues enabling arrests to be made Thirty-six suspects mmitted suicide: 41 were proceeded against: 17 were und to be insane: 14 were convicted and sentenced to ath, the sentence being executed on six of them

MONDAY, MARCH 14TH.

Milk-supply and Public Health.

Captain Elliston asked the Minister of Agriculture ther, in view of the connexion of the milk supply with various aspects of health and the prevention of disease, ntation would be given to the public health interests the commission for the reorganisation of the milk dustry—Sir John Gilmour replied: I regret I cannot rtake to give representation on the commission to any particular interest, but I will, however, bear my hon. friend's suggestion in mind.

Remedies for Pulmonary Phthisis.

Mr. Mander asked the Minister of Health whether he was aware of the cures effected in cases of pulmonary phthisis by the British remedy Umckaloabo; and whether he would give instructions for this fact to be officially brought to the notice of medical officers in official appointments concerned with this disease—Sir E Hilton Young replied: The evidence available in regard to the efficacy of this preparation has been carefully considered on several occasions I am advised that the claims made on its behalf in regard to tuberculosis do not appear to differ in character or degree from those made for many other so called ' remedies " which have been advertised from time to time and afterwards found to be valueless. The answer to the second part of the question is in the negative.

Sickness among Women Workers.

Mr. Louis Smith asked the Minister of Health whether his attention had been called to the increase of sickness among women workers coming under the national health insurance scheme, and especially married women; and whether he could give any accepted explanation of such increase.—Sir E. Hilton Young replied: I am aware of the increase that has taken place in the claims of insured women workers, and particularly married women, to sickness and disablement benefit, as compared with the experience of some years ago. It is not possible to give a specific explanation of this increase, which is believed to be the combined result of a number of causes acting together. The whole subject of women's insurance is at present engaging my attention.

Fatal Railway and Road Accidents.

Mr. Somervell asked the Home Secretary how many persons had been killed in railway accidents and road accidents, respectively, in the last five years—Sir H. Samuel replied: The number of persons killed in Great Britain in railway and road accidents respectively during the years since 1926 were as follows.—

	1926.	*1927.*	*1928.*	*1929.*	*1930.*	*Total.*
Railway	374	435	160	417	380	2,066
Road	4886	5329	6138	6696	7305	30,354

For 1931 the figures of railway accidents are not yet available; the number of road accidents was 6690.

TUESDAY, MARCH 15TH.

Provision of Meals for School-children.

Mr Joel asked the President of the Board of Education whether the estimate for special services in connexion with elementary education outlay showed any increase in the provision of meals for children: and whether he was satisfied that this requirement was adequately met—Mr. Ramsbotham (Parliamentary Secretary to the Board of Education) replied: In the Board's estimates for 1932 allowance is made for increased expenditure by local education authorities on the provision of meals to the extent of £20,000, as shown on page 12 of the Estimates Memorandum (Cmd 4031) It is not possible to forecast the actual expenditure to be incurred on this service, but my right hon. friend is satisfied that, so far as can at present be ascertained, the estimate is adequate for any probable requirements.

Medical and Dental Officers in the Navy.

Mr. Price asked the First Lord of the Admiralty whether the number of medical and dental officers was up to the establishment, as no provision was made for examinations for entry in the Estimates for 1932—Lord Stanley (Parliamentary Secretary to the Admiralty) replied: The establishment of naval medical officers is not complete, there being a deficiency of approximately 60. The entrance examination is at present in abeyance, and entries are being made for short service by selection after interview. The number of dental officers is one short of establishment. When the number of vacancies does not justify the holding of a competitive examination, entries are made by selection after interview in the same manner as for the entry of medical officers for short service.

A "LEWIS CARROLL WARD."—It is proposed to endow a ward for children at St Mary's Hospital, W.2, as a tribute to the author of "Alice in Wonderland" at a minimum cost of £10,000 The scheme is supported by the Prime Minister, Mr Stanley Baldwin, Mrs Hargreaves (the original "Alice"), Sir J. M. Barrie, and other distinguished persons right to choose whether they would have gas or electricity in their houses.

Dr. HOWITT said he regarded it as entirely wrong to grant to any council the power to force either gas or electricity upon its tenants, and not to allow them the choice of having either or both. There were in this country at present too many laws restricting the liberty of the individual. If this Bill was not passed the poorer tenants in these council houses at Kettering would not be able to afford electric light, and would have to use candles and oil lamps. He spoke as a doctor who had spent many years of his life in Lambeth, working under conditions such as that, and it was very difficult indeed for a medical man to attend adequately to any patient in distress under such conditions. He had been told that in certain council houses in this country doctors who had been called to confinement cases had to carry on their work by the spluttering light of a candle. That was a monstrous thing to happen in these days. He urged the House to give the Bill a second reading.

Mr. ERNEST BROWN (Parliamentary Secretary to the Ministry of Health) said that the Minister of Health had given this matter very careful consideration, and it was his clear opinion that this Bill should go to a Committee of the House where the issues could be thrashed out.

The Bill was read a second time.

HOUSE OF COMMONS.

WEDNESDAY, MARCH 9TH.

Increase in Mental Deficiency.

Sir JOHN BIRCHALL asked the Minister of Health whether he had considered the resolution sent to him by the Leeds City Council in reference to the increase in mentally deficient persons and advocating a measure to prevent the procreation of children by mentally deficient persons; and whether he proposed to take any steps in the direction indicated.—Mr. E. BROWN (Parliamentary Secretary to the Ministry of Health) replied: Yes, Sir. As indicated in my reply to a question on Feb. 15th, my right hon. friend is arranging for certain preliminary investigations as a first step towards a general inquiry into this problem.

Tin Foil Wrapping.

Mr. THORNE asked the Minister of Health the number of poisoning cases which had been proved to be attributable to foodstuffs wrapped in tin or lead foil; and whether he would consider the advisability of issuing an order for the immediate wrapping of foodstuffs to be either grease-proof or cellophane.—Mr. ERNEST BROWN replied: Apart from one unverified case in which poisoning was suggested, my right hon. friend has no information that wrappers of tin or lead foil have been the cause of food poisoning. In these circumstances, he would not be justified in making such an order as is suggested.

Tuberculosis in Glasgow Area.

Mr. MCGOVERN asked the Secretary of State for Scotland the number of persons from the Glasgow area who were at present certified as suffering from tuberculosis; the number in institutions; the names of the institutions concerned; and the ages of the persons.—Sir ARCHIBALD SINCLAIR replied: The number of persons in Glasgow who were known to be suffering from tuberculosis on the 3rd instant was 9675. The number of Glasgow tuberculosis patients in institutions on that date was 1714 and the names of the institutions in which these patients were resident are as follows: Ruchill Hospital, Knightswood Hospital, Robroyston Hospital, Bellefield Sanatorium, Mearnskirk Hospital, Darnley Hospital, Ochil Hills Sanatorium, Bridge of Weir Sanatorium, Dunblane Sanatorium, Lanfine Homes, Stobhill Hospital, Barnhill Hospital, Eastern District Hospital, Oakbank Hospital, Merryflats Hospital, Hairmyres Sanatorium, and Strathblane Children's Hospital. The patients in question are of all ages, and to classify them according to age would involve an amount of labour out of proportion to the value of the result.

Hypodermic Syringes for Panel Patients.

Mr. LOGAN asked the Minister of Health if he was prepared to include in the second schedule to the National Health Insurance Consolidated Regulations hypodermic syringes and needles, so that insured patients might use them for asthma self-treatment, when prescribed.—Sir E. HILTON YOUNG replied: As the result of a recent discussion of this matter by my department with representatives of doctors in insurance practice, I am not satisfied that there are any sufficient reasons for making these appliances available as part of medical benefit.

THURSDAY, MARCH 10TH.

Experiments on a Monkey.

Mr. HOPKIN MORRIS asked the Home Secretary if his attention had been called to experiments performed upon a monkey, denominated for the purposes of the experiments monkey 420, involving severe and enduring pain; and whether in this case the animal was forthwith painlessly destroyed.—Sir HERBERT SAMUEL replied: I presume that the hon. Member is referring to the experiments performed in the course of the investigation into an outbreak of rabies in Trinidad an account of which was published in THE LANCET of Sept. 19th last. I am advised that the symptoms recorded in the report of the experiments were mental in character due to the injections, and that there is no reason to suppose that the animal was suffering severe pain which was likely to endure.

Mr. MORRIS: Is the right hon. gentleman aware that it the article describing this experiment it is stated that th animal was kept alive for a period of ten days?

Sir H. SAMUEL: No, Sir. I was unaware that it was ten days, but that does not affect the answer I have given.

Scientific Analysis and Criminal Investigation.

Mr. CROSS asked the Home Secretary whether in view o the high cost of fees paid to analysts and others by th metropolitan police, he would give instructions for al examinations of garments and other specimens to be carrie out by the scientific branch of the Criminal Investigatio Department at Scotland Yard in all cases which could b dealt with by means of ordinary scientific apparatus.—Sir HERBERT SAMUEL replied: The total cost of such fees i any one year is not high, the average for the last three yea being less than £100 a year. Where expert evidence o scientific matters is in question, it is better that it shoul be given by independent witnesses free upon occasion t give evidence either for a prosecution or for a defence at not regularly employed to give evidence for the police onl

Sexual Offences against Young Children.

Viscountess ASTOR asked the Home Secretary wheth he was aware that sexual offences against children und 16 were increasing; that the five-year average for indece assaults against them was the highest recorded for ov 30 years; and what steps he proposed to take to che these offences.—Sir HERBERT SAMUEL replied: The figu of offences of defiling girls under 13 show a decrease, l those respecting girls from 13 to 16 an increase. There reason to believe that the statistics are affected by a grea readiness on the part of relatives and friends to report offen to the police instead of concealing them. I would add th the number of persons proceeded against also shows appreciable increase.

Viscountess ASTOR: Does not the right hon. gentlem think that it would be wise to increase the number of women police, because many parents will report to won when they will not report to men, and is he aware tha committee set up to look into sexual offences recommen that we should have more women police?

Sir H. SAMUEL: It is possible, and indeed probable t offences are more readily reported in some cases to won police, but a very large increase in the number of won police might not succeed in stopping the actual offen themselves.

Mr. BRIANT asked the Home Secretary if he could giv statement showing the number of complaints made to police during each of the years 1926–31 of sexual offen against young persons; and the number of persons char with these offences during the same period.—Sir HERB SAMUEL replied: The following are the numbers of offences known to police and (B) persons proceeded agai in Courts of Summary Jurisdiction for certain sexual offen during the years 1926 to 1930.

—	1926.		1927.		1928.		1929.		193
	A.	B.	A.	B.	A.	B.	A.	B.	A.
Defilement of girls—									
Under 13	86	64	91	65	73	59	76	61	58
Under 16	223	185	279	218	275	218	346	259	402
Attempts to commit unnatural offences—									
Indecent assaults on males under 16 ..	†	125	†	167	†	162	†	162	†
Indecent assaults on females under 16 ..	†	969	†	933	†	939	†	949	†

† = Numbers not available.

ADDRESSES AND ORIGINAL ARTICLES

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: L. J. WITTS, M.D. MANCH., F.R.C.P. LOND.,
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corset belt, which is made to the measurements of each patient and fitted by Madame Rose, 97, Mortimer-street, London, W.1, has the outward appearance of and indeed may take the place of an ordinary corset. The only suggestion we might offer for still further improvement is that the pad, which is at present covered with chamois leather, should have an outer detachable covering of very thin rubberised material so that its surface can be easily washed. Satisfactory reports have been received by us from physicians who have ordered this belt for their patients.

Appointments

BEAL, J. R., M.D., Ch.B., D.P.H., has been appointed Clinical Tuberculosis Officer for Sunderland.

EDGE, F., M.D. Lond., F.R.C.S. Eng., Medical Referee under the Workmen's Compensation Act for Wolverhampton County Court District.

Surgeons under the Factory and Workshop Acts: BOURKE, I. M., F.R.C.S. Edin., D.P.H. (Falmouth); KERR, J., M.B., Ch.B. St. And. (Bexhill); THOMSON, M. L. M., (Hoddesdon, Hertford).

LONDON COUNTY COUNCIL: NORRIS, T. St. M., M.B., B.Chir. Camb., Assistant Medical Officer, North-Eastern Hospital; MCMENEMEY, W. H., M.B., B.Ch., House Physician, North-Western Hospital; MILLOY, J. McN., M.B., Ch.B., Deputy Medical Superintendent, St. Andrew's Hospital; PRICE, I., M.B., B.S. Lond., F.R.C.S. Eng., Deputy Medical Superintendent, Bethnal Green Hospital; JOHNSTONE, J. G., M.B., Ch.B. Aberd., Medical Superintendent, Princess Mary's Hospital for Children, Margate; Hodson, H. B., M.B., B.S., Assistant Medical Officer, Grove Park Hospital; STEVENSON, R. S., M.B., Ch.B., M.D. Edin., Consulting Laryngologist at certain Special Hospitals; BLACKLEE, E. T., M.R.C.S., L.R.C.P. Lond., House Physician, Lewisham Hospital.

Vacancies

For further information refer to the advertisement columns.

Altrincham General Hospital.—Jun. H.S. At rate of £120.
Babies Club, Chelsea.—Asst. M.O.
Barnsley, Beckett Hospital and Dispensary.—H.P. £200.
Bath, Royal Mineral Water Hospital.—Physician.
Belgrave Hospital for Children, 1, Clapham-road, S.W.—Two H.P.'s and One H.S. Each at rate of £100.
Birmingham City Mental Hospital.—Med. Supt. £625.
Blackburn County Borough.—Res. Asst. M.O. and Jun. Asst. M.O. £350 and £150 respectively.
Bolton Infirmary and Dispensary.—H.P. £150.
Brighton County Borough Sanatorium and Infectious Diseases Hospital.—Jun. Res. M.O. At rate of £150.
Brighton, Royal Sussex County Hospital.—Hon. Clin. Asst. for Ophth. Dept.
Bristol Dispensary.—M.O.
Burton-on-Trent General Infirmary.—Jun. H.S. £150.
Canterbury, Kent and Canterbury Hospital.—H.P. At rate of £125.
Cardiff, Glan Ely Hospital, Fairwater.—Third Asst. Res. M.O. £250.
Cardiff, Prince of Wales Hospital for Limbless and Crippled.—Locum Tenens, Res. Surgeon. 4 gns. a week.
Charing Cross Hospital, W.C.—Res. M.O. £350.
Chelmsford Borough.—M.O.H. and School M.O. £800.
Coventry, Coventry and Warwickshire Hospital.—Hon. Asst. Pathologist.
Croydon General Hospital.—Cas. H.S. £125.
Doncaster Royal Infirmary.—Sen. Cas. H.S. At rate of £175
Dover, Royal Victoria Hospital.—Res. M.O. £180.
Durham County Hospital.—Two H.S.'s. Each £150.
Edinburgh Royal Hospital for Mental and Nervous Disorders.—Asst. Physician. £300.
Exeter, Royal Devon and Exeter Hospital.—H.S. to Special Depts. At rate of £150.
Freemason's Hospital and Nursing Home, 237, Fulham-road, Chelsea, S.W.—Surgeon Dentist.
.—Surgeon.
£150.
At rate of £150.
W.C.—H.P. and H.S. Each at rate of £100.
Ilford, King George Hospital.—Cas. H.S. At rate of £100.
Ipswich, East Suffolk and Ipswich Hospital.—H.S. and H.P. Each £120.
Lancaster County Mental Hospital.—Asst. M.O. £500.
—Second Asst. M.O. £125.
.S. At rate of £150.
Asst. M.O. £200.
—Res. H.S. At rate of £100.
L.C.C.—Res. Asst. M.O.'s for Various Institutions. Each £250. Also Res. Asst. M.O. for Hammersmith Hospital, Ducane-road, W. £350. Also Visiting M.O. for Edmonton Colony, Edmonton, N. £200.
London Lock Hospital, 91, Dean-street, W.—H.S. for Male Lock Hospital. At rate of £175.
Maidstone, Kent County Ophthalmic and Aural Hospital.—H.S. to Ear, Nose, and Throat Dept. At rate of £200.
Manchester Royal Eye Hospital.—Jun. H.S. £120.
Manchester Royal Infirmary, Central Branch, Roby-street.—H.S. At rate of £100.
Manchester Ro
Metropolitan *E.*—Sen. and Jun.
H.P.'s an Each at rate of £100.
Middlesbrough, Holgate Municipal Hospital.—Jun. Res. M.O. At rate of £160.
Miller General Hospital, Greenwich-road, S.E.—Hon. Orthopædic Surgeon.
National Temperance Hospital, Hampstead-road, N.W.—Surg. Reg. 40 gns.
Northwood, Mount Vernon Hospital.—Res. M.O. £250.
Princess Beatrice Hospital, Richmond-road, Earl's-court, S.W.—Surgeon to Throat, Nose and Ear Dept., Physician to Out-patients' Dept.
Queen's Hospital for Children, Hackney-road, E.—Surgeon to Ear, Nose, and Throat Dept.
Queen's Institute of District Nursing, 58, Victoria-street, S.W.
General Supt.
Rochdale Infirmary and Dispensary.—Jun. H.S. £200.
Royal London Ophthalmic Hospital, City-road, E.C.—Sen. Res.
O. At rate of £150.
Roya
Roya *nd Women, Waterl*
Department and H
St. L *o-Urinary Organs*
St. I .S. At rate of £150
Sam *rylebone-road, N.W.*
£15
Stoke-on-T O.
Taunton,
H.S. *S.W.*
Victoria
Dental Surgeon.
West London Hospital, Hammersmith-road, W.—Hon.
Radiologist.
The Chief Inspector of
for Certifying Fact
Newmarket (Suffol...,

Births, Marriages, and Deaths

BIRTHS.

GREY.—On March 9th, at Sloane-street, S.W., the wife
Dr. J. C. P. Grey, Malayan Medical Service, of a daugh
ROLSTON.—On March 8th, at Crofts, Haslemere, the wi
Dr. G. R. Rolston, of a son.
STILL.—On March 8th, at Bareilly, India, the wife
Captain R. M. Lloyd Still, I.M.S., of a daughter.
TOOTH.—On March 6th, at Albion-street, Lewes, the wi
Ronald S. Tooth, M.A., M.R.C.S., L.R.C.P., of a son.

DEATHS.

ALLINGHAM.—On March 7th, Christian Philip Sidney Allingh
M.R.C.S., L.R.C.P., aged 40.
ASHWELL.—On March 12th, at The Rope-walk, Notting
Herbert George Ashwell, O.B.E., M.R.C.S., aged 74.
HUGHES.—On March 7th, at Downhouse, Whitchurch, Tavist
Robert Harry Hughes, M.A., M.B. Camb., aged 86.
JAMES.—On March 10th, at Littlehampton, after a short ill
Herbert Noel James, M.B., B.S. Lond., aged 33.
MOREHEAD.—On March 8th, Henry Ruddock Morehead,
L.R.C.P., & S. Edin., late S.M.O. Nigeria, of Sunn
Cheddar, aged 48.
SYDENHAM.—On March 7th, 1932, at Pitt House, Da
Devon, George Mervyn Sydenham, M.D., late of Chel
Gate, Sussex, second son of the late Rev. J. G. and
Sydenham, of Cullompton and Exmouth, aged 62.

N.B.—A fee of 7s. 6d. is charged for the insertion of Noti Births, Marriages, and Deaths.

ROYAL FREE HOSPITAL.—At the annual me
last week it was stated that in 1931 the expend
was £90,813, which left a deficit of £5355. There
6124 in-patients and 58,083 out-patients. The N
Home is to be completed at a cost of £65,000,
which, with the exception of £10,000, has been pro
for. Closer and longer union with the medical schoo
been arranged by an agreement for 50 years. The
clinic has made great progress, as also has the ort
department; it is hoped to open the cleft palate and
lip ward at an early date. A ward in the maternity d
ment is to be named after the late Dame Mary Scha

DEBT OF LIVERPOOL SOUTHERN HOSPITAL.—
overdraft of this hospital having reached £36,73
bank has refused to honour any more cheques
there are funds to meet them. Meanwhile arrange
have been made for meeting current expenses. The secr
states that unless an increased income can be obt
certain wards will have to be closed and paying patient
accepted, or the hospital will have to be shut up ent
A committee has been appointed to consider the positi

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* The third Goulstonian Lecture for 1932 delivered before the Royal College of Physicians of London on March 8th.

corset belt, which is made to the measurements of each patient and fitted by Madame Rose, 97, Mortimer-street, London, W.1, has the outward appearance of and indeed may take the place of an ordinary corset. The only suggestion we might offer for still further improvement is that the pad, which is at present covered with chamois leather, should have an outer detachable covering of very thin rubberised material so that its surface can be easily washed. Satisfactory reports have been received by us from physicians who have ordered this belt for their patients.

Appointments

BEAL, J. R., M.D., Ch.B., D.P.H., has been appointed Clinical Tuberculosis Officer for Sunderland.

EDGE, F., M.D. Lond., F.R.C.S. Eng., Medical Referee under the Workmen's Compensation Act for Wolverhampton County Court District.

Surgeons under the Factory and Workshop Acts: BOURKE, I. M., F.R.C.S. Edin., D.P.H. (Falmouth); KERR, J., M.B., Ch.B. St. And. (Bexhill); THOMSON, M. L. M., (Hoddesdon, Hertford).

LONDON COUNTY COUNCIL: NORRIS, T. St. M., M.B., B.Chir. Camb., Assistant Medical Officer, North-Eastern Hospital; MCMENEMEY, W. H., M.B., B.Ch., House Physician, North-Western Hospital; MILLOY, J. McN., M.B., Ch.B., Deputy Medical Superintendent, St. Andrew's Hospital; PRICE, I., M.B., B.S. Lond., F.R.C.S. Eng., Deputy Medical Superintendent, Bethnal Green Hospital; JOHNSTONE, J. G., M.B., Ch.B. Aberd., Medical Superintendent, Princess Mary's Hospital for Children, Margate; Hodson, H. B., M.B., B.S., Assistant Medical Officer, Grove Park Hospital; STEVENSON, R. S., M.B., Ch.B., M.D. Edin., Consulting Laryngologist at certain Special Hospitals; BLACKLEE, E. T., M.R.C.S., L.R.C.P. Lond., House Physician, Lewisham Hospital.

Vacancies

For further information refer to the advertisement columns.

Altrincham General Hospital.—Jun. H.S. At rate of £120.
Babies Club, Chelsea.—Asst. M.O.
Barnsley, Beckett Hospital and Dispensary.—H.P. £200.
Bath, Royal Mineral Water Hospital.—Physician.
Belgrave Hospital for Children, 1, Clapham-road, S.W.—Two H.P.'s and One H.S. Each at rate of £100.
Birmingham City Mental Hospital.—Med. Supt. £625.
Blackburn County Borough.—Res. Asst. M.O. and Jun. Asst. M.O. £350 and £150 respectively.
Bolton Infirmary and Dispensary.—H.P. £150.
Brighton County Borough Sanatorium and Infectious Diseases Hospital.—Jun. Res. M.O. At rate of £150.
Brighton, Royal Sussex County Hospital.—Hon. Clin. Asst. for Ophth. Dept.
Bristol Dispensary.—M.O.
Burton-on-Trent General Infirmary.—Jun. H.S. £150.
Canterbury, Kent and Canterbury Hospital.—H.P. At rate of £125.
Cardiff, Glan Ely Hospital, Fairwater.—Third Asst. Res. M.O. £250.
Cardiff, Prince of Wales Hospital for Limbless and Crippled.—Locum Tenens, Res. Surgeon. 4 gns. a week.
Charing Cross Hospital, W.C.—Res. M.O. £350.
Chelmsford Borough.—M.O.H. and School M.O. £800.
Coventry, Coventry and Warwickshire Hospital.—Hon. Asst. Pathologist.
Croydon General Hospital.—Cas. H.S. £125.
Doncaster Royal Infirmary.—Sen. Cas. H.S. At rate of £175
Dover, Royal Victoria Hospital.—Res. M.O. £180.
Durham County Hospital.—Two H.S.'s. Each £150.
Edinburgh Royal Hospital for Mental and Nervous Disorders.—Asst. Physician. £300.
Exeter, Royal Devon and Exeter Hospital.—H.S. to Special Depts. At rate of £150.
Freemason's Hospital and Nursing Home, 237, Fulham-road, Chelsea, S.W.—Surgeon Dentist.
Gloucester, Gloucestershire Royal Infirmary, &c.—Surgeon.
Guildford, Royal Surrey County Hospital.—H.S. £150.
[illegible] *al Hospital.*—H.P. At rate of £150.
[illegible] *reat Ormond-street, W.C.*—H.P. and [illegible] 100.
[illegible] —Cas. H.S. At rate of £100.
Ipswich, East Suffolk and Ipswich Hospital.—H.S. and H.P. Each £120.
Lancaster County Mental Hospital.—Asst. M.O. £500.
Lincoln, Bracebridge Mental Hospital.—Second Asst. M.O. £125.
Liverpool, Bootle General Hospital.—H.S. At rate of £150.
Liverpool, Mill-road Infirmary.—Res. Asst. M.O. £200.
Liverpool Royal Children's Hospital.—Res. H.S. At rate of £100.
L.C.C.—Res. Asst. M.O.'s for Various Institutions. Each £250. Also Res. Asst. M.O. for Hammersmith Hospital, Ducane-road, W. £350. Also Visiting M.O. for Edmonton Colony, Edmonton, N. £200.
London Lock Hospital, 91, Dean-street, W.—H.S. for Male Lock Hospital. At rate of £175.
Maidstone, Kent County Ophthalmic and Aural Hospital.—H.S. to Ear, Nose, and Throat Dept. At rate of £200.
Manchester Royal Eye Hospital.—Jun. H.S. £120.
Manchester Royal Infirmary, Central Branch, Roby-street—H.S. At rate of £100.
Manchester R[illegible]
Metropolitan [illegible] *E.*—Sen. and Jun. H.P.'s an[illegible] Each at rate of £1[illegible]
Middlesbrough, Holgate Municipal Hospital.—Jun. Res. M.O. At rate of £160.
Miller General Hospital, Greenwich-road, S.E.—Hon. Orthopædic Surgeon.
National Temperance Hospital, Hampstead-road, N.W.—Surg. Reg. 40 gns.
Northwood, Mount Vernon [illegible]
Princess Beatrice Hospital, [illegible] *W.*—Surgeon to Throat, N[illegible] Out-patients' Dept.
Queen's Hospital for Children, Hackney-road, E.—Surgeon t[illegible] Ear, Nose, and Throat Dept.
Queen's Institute of District Nursing, 58, Victoria-street, S.W. General Supt.
Rochdale Infirmary and Dispensary.—Jun. H.S. £200.
Royal London Ophthalmic Hospital, City-road, E.C.—Sen. Res [illegible] O. At rate of £150.
Royal Naval [illegible]
Royal Waterlo[illegible] *d Women, Waterlo*[illegible] *road, S.E.*- [illegible] Department and H.S. At rate of [illegible]
St. Helens Hospital.—H.S. £200.
St. Paul's Hospital for Diseases of the Genito-Urinary Organs and Skin, Endell-street, Holborn, W.C.—H.S. At rate of £150.
Samaritan Free Hospital for Women, Marylebone-road, N.W.—Anæsthetist.
Stoke-on- [illegible] —H.S. £1[illegible]
Taunton, [illegible] ouse M.O. and H.S. At rate of £150 and £100 respectively.
Victoria Hospital for Children, Tite-street, Chelsea, S.W.—Dental Surgeon.
West London Hospital, Hammersmith-road, W.—Hon. Med. Radiologist.

The Chief Inspector of [illegible] for Certifying Fact[illegible] Newmarket (Suffo[illegible]

Births, Marriages, and Deaths

BIRTHS.

GREY.—On March 9th, at Sloane-street, S.W., the wife of Dr. J. C. P. Grey, Malayan Medical Service, of a daught[illegible]

ROLSTON.—On March 8th, at Crofts, Haslemere, the wife of Dr. G. R. Rolston, of a son.

STILL.—On March 8th, at Bareilly, India, the wife of Captain R. M. Lloyd Still, I.M.S., of a daughter.

TOOTH.—On March 6th, at Albion-street, Lewes, the wife of Ronald S. Tooth, M.A., M.R.C.S., L.R.C.P., of a son.

DEATHS.

ALLINGHAM.—On March 7th, Christian Philip Sidney Allingham, M.R.C.S., L.R.C.P., aged 40.

ASHWELL.—On March 12th, at The Rope-walk, Nottingham, Herbert George Ashwell, O.B.E., M.R.C.S., aged 74.

[illegible] Tavistock

HUGHES.—On March 7th, at [illegible] Robert Harry Hughes, [illegible] illness

JAMES.—On March 10th, at [illegible] Herbert Noel James, M[illegible] l, M.C.

MOREHEAD.—On March 8th [illegible] nnysi[illegible] L.R.C.P., & S. Edin., late S.M.O. Nigeria, Cheddar, aged 48.

SYDENHAM.—On March 7th, 1932, at Pitt House, Dawlish, Devon, George Mervyn Sydenham, M.D., late of Chelwood Gate, Sussex, second son of the late Rev. J. G. and Mr[illegible] Sydenham, of Cullompton and Exmouth, aged 62.

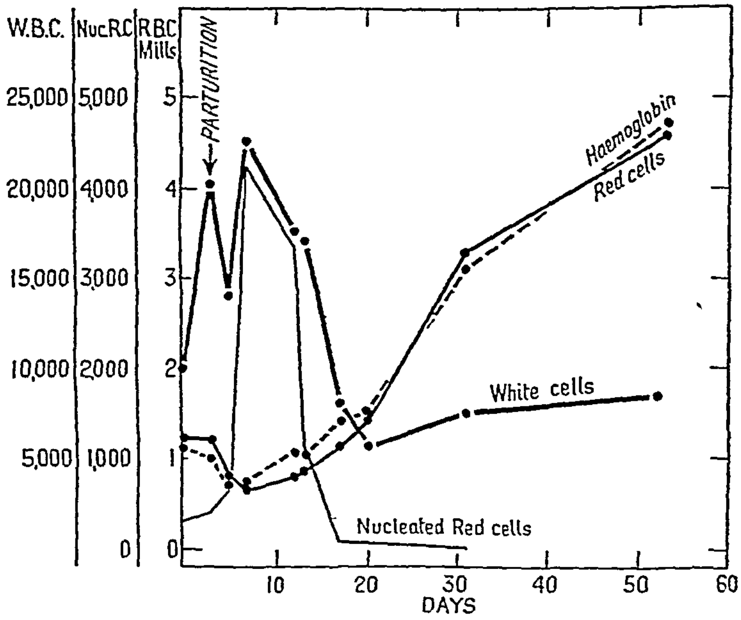
N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

ROYAL FREE HOSPITAL.—At the annual meetin[illegible] last week it was stated that in 1931 the expenditu[illegible] was £90,813, which left a deficit of £5355. There we[illegible] 6124 in-patients and 58,083 out-patients. The Nur[illegible] Home is to be completed at a cost of £65,000, all which, with the exception of £10,000, has been provid[illegible] for. Closer and longer union with the medical school [illegible] been arranged by an agreement for 50 years. The den[illegible] clinic has made great progress, as also has the orthodo[illegible] department; it is hoped to open the cleft palate and ha[illegible] lip ward at an early date. A ward in the maternity depa[illegible] ment is to be named after the late Dame Mary Scharlie[illegible]

DEBT OF LIVERPOOL SOUTHERN HOSPITAL.—Th[illegible] overdraft of this hospital having reached £30,732 [illegible] bank has refused to honour any more cheques un[illegible] there are funds to meet them. Meanwhile arrangemen[illegible] have been made for meeting current expenses. The secreta[illegible] states that unless an increased income can be obtain[illegible] certain wards will have to be closed and paying patients or [illegible] accepted, or the hospital will have to be shut up entire[illegible] A committee has been appointed to consider the position.

first seen four months after confinement and died five months after confinement; another did not come under treatment until seven months after confinement. The disease arises only during pregnancy and never regresses before the expulsion of the fœtus. The natural duration of the disease might be placed between three and twelve months. The strain of labour causes an exacerbation. After labour the disease terminates with an outpouring of immature red cells and rapid regeneration of the blood, but the reparative phase may be postponed for weeks or months after delivery. In Fig. 3 I have summarised the data from a 5-para, aged 29, reported by Jungmann. Her illness began about the eighth month and she was first seen a few days before delivery. No specific treatment was given. The exacerbation after labour and the spontaneous recovery with outpouring of normoblasts and megaloblasts are well shown.

FIG. 3,



Spontaneous recovery of hæmolytic anæmia of pregnancy.

Estimates of the mortality of the hæmolytic anæmia of pregnancy have steadily fallen as more cases have been collected and the death-rate of all cases reported since 1917 works out at 30 per cent. Post mortem there is œdema, anæmia, and fatty degeneration of the viscera, the spleen is enlarged, the liver shows hæmosiderosis, the bone-marrow is hyperplastic, myeloid and erythroblastic tissues are increased, and megaloblasts are present. Recovery is complete and permanent. Two of Naegeli's patients have now been under observation and remained well for thirty years. Should the patient become pregnant again however, the risk of relapse is considerable. Even one authenticated relapse would be important in a disease so rare as this. Actually the literature contains more records of relapses in subsequent pregnancies than of normal confinements.

TREATMENT.

Many drugs have been used in the treatment of the hæmolytic anæmia of pregnancy, iron, arsenic, and hydrochloric acid being the favourites, but none of them appears to have done any good. Transfusion was the only effective remedy before treatment by liver was introduced, and it remains the first remedy for patients in extremis. Four to five hundred cubic centimetres of blood should be given at a transfusion and the operation should be repeated at short intervals of time until a remission is induced. Before confinement the effect of transfusion is temporary, and it has no power to arrest the disease while the fœtus is in the uterus. After parturition it is nearly always followed by complete and rapid cure, if the patient is not too collapsed and if sufficient blood is injected. Nevertheless one of Filo's patients died five months after parturition in spite of four transfusions.

Liver has been given in many of the cases reported in recent years and the results are often quoted as proof of its curative power. It is surprising how few of the publications can be so construed. Usually liver treatment has been combined with transfusion, or it has not been prescribed till the patient was already recovering, or exact hæmatological details are lacking. Conclusive proof of the value of liver is scanty. In a few cases, however, it has been possible to arrest the progress of the anæmia before confinement, which was a very rare event before the introduction of liver therapy, and in other cases, in which the anæmia has remained torpid after confinement, treatment by liver has brought about speedy improvement.

Beckmann (1928) treated two women by parental injection of liver extract and they were able to go to term. In the case separately reported by Dyke and by Stewart and Harvey, the disease was arrested two months defore delivery by a transfusion followed by pil. ferri. grs. 5. b.d., and Liveroid 2 oz. in die. A similar case in which liver treatment was supplemented by three transfusions and the disease was arrested three months before delivery was reported by Deschamps and Froyez, and by Devraigne and Laennec (same case). Peterson's patient, who had gone downhill in spite of two transfusions, rapidly improved before delivery on a diet containing half a pound of liver a day. On the other hand, Meaker and Bongiorno failed to arrest the disease by injection of liver extract before confinement, and Wery found iron and liver ineffective in a patient who ultimately recovered after premature delivery and transfusions. The majority of the publications concern the administration of liver after delivery, and are vitiated by the absence of control periods, by the use of other forms of treatment, and by the natural tendency of the disease to get well. Nevertheless good evidence of the value of liver is provided by the following two cases. A patient of Peterson first came under treatment two months after delivery; there was a clear reticulocyte crisis and steady improvement after the administration of liver. In Lenner's patient an anæmia with high colour-index had persisted for ten months after delivery, and she likewise improved on treatment with liver.

The advisability of operative interference is still unsettled and the question waits an answer till we know more of the value of liver before confinement.

Petersen and Dyke found mean diameters of the red cells of 7·72, 8·0, and 8·16 microns. Larrabee and Wintrobe found the mean corpuscular volume increased. Price-Jones curves showing a considerable shift to the right are figured by Parvu and Fouquiau, and by Hampson and Shackle. It is unusual for the white count to be above 15,000 before labour, and high values after labour are sometimes ascribable to puerperal infection. Nevertheless a patient reported by Fabre and Trillat had 17,000 white cells per c.mm. a week before confinement, and Lenner's patient had 45,000 white cells per c.mm. with 22 per cent. of monocytes and myelocytes at the onset of labour. Large numbers of myelocytes and myeloblasts in patients who recovered are reported by Benda, Bruggemann, and Jungmann. Of great interest in early cases is the colour-index, which in Drexel's patient was high from the start. In five other cases with initial red cell counts above 2·5 millions, it was high in two (Meaker, Murdoch) and 0·7 or lower in three (Esch, Minot, Pohl). There is a good deal of evidence that the colour-index is often low at the onset, rising as the malady progresses. When the anæmia is established, the colour-index is high unless there are complications such as hæmorrhage or infection. In isolated cases the colour-index has been low throughout, though the diagnosis has been proved at post-mortem.

TABLE II.

Author.	Before confinement.	After confinement.
Vallois et C. de C. ..	60/40	Normal.
Vermelin et Vigneul ..	90/425	Approx. normal.
Ecalle	—	Normal.
Jousselin	72/40	—
Tchertkoff	—	Normal.
Parvu	—	..
Evans	—	50/
Devraigne	50/45	—
Lenner	52/42	—
Minot	54/32	Normal.
Oettingen	—	47/43
Petersen	—	60/
Petersen	Normal.	—

SYMPTOMS AND COURSE OF ILLNESS.

Digestive symptoms, stomatitis, glossitis, pharyngitis, vomiting, and diarrhœa are among the most prominent symptoms of the hæmolytic anæmia of pregnancy. It is usually difficult to date their onset, as they may follow and be inseparable from the dyspeptic troubles of the early months of pregnancy. It is probable that they do not appear till after the anæmia has developed. Most recorded early cases of hæmolytic anæmia of pregnancy have been discovered by accident in the course of a routine investigation, and the patient has had no gastro-intestinal symptoms. There are many cases in which these symptoms have first been noticed at the time of an aggravation of the anæmia during the puerperium. The inflammations about the mouth are sometimes a simple reddening and vesiculation of the mucosa, but in other patients they are ulcerous, necrotic, foul-smelling lesions. Anal gangrene has also been described. Such lesions are of course common in many cachectic states. One must therefore conclude that the gastro-intestinal disturbances are secondary to the anæmia and not primary or causative, though one must confess that their resemblance to the gastro-intestinal disturbances of pernicious and allied anæmias can be very striking.

In recent years there has been a tendency to believe that achlorhydria is present and plays an ætiological rôle in the hæmolytic anæmia of pregnancy. This belief is false and is easily traced to errors in diagnosis and to a misunderstanding of the literature. Achlorhydria is frequent in the chronic microcytic anæmia of women and in tropical macrocytic anæmia. Both of these maladies are made worse by pregnancy and are then often confused with the true hæmolytic anæmia, though they differ from it in history, symptoms, pathology, treatment, and future cou Putting aside all such cases, one finds that achlor-hydria is uncommon in the hæmolytic anæmia of pregnancy and cannot be an ætiological factor, as is clear from the following table. Not all these meals were fractional, and the true incidence of achlorhydria is probably lower than 33 per cent. In a few instances a temporary depression of gastric secretion has been observed in the period of profound anæmia.[25] [65]

TABLE III.

Author.	Normal.	Achlorhydria.	Author.	Normal	Achlor-hydria
Dyke ..	2	—	Heim ..	1	—
Filo ..	2	1	Powell-Davy	—	1
Jungmann ..	1	—	Roth ..	—	1
Halir ..	1	—	Weinberg ..	—	1
Rowland ..	1	—	Beyer-Gurowitsch	—	1
Peterson ..	3	—	Schupbach ..	1	1
Evans ..	1	—			
Benda ..	1	1		14	7

The disease begins usually in the third trimester of pregnancy, but a few cases have been diagnosed as early as the fourth month and a much greater number have no symptoms until the puerperium. Drexel's case is of great interest not only because of the early diagnosis but also because of the data on the rate of development of the anæmia:—

A primigravida, aged 21, was admitted to hospital at th fourth month for pyelitis. The pyelitis cleared up in a few days but she remained pale and ill, and indeed und fatigue and anæmia became more oppressive. It wa elicited that she had always been healthy and strong u to the onset of her pregnancy, since when she had becom pale. The liver and spleen were not palpable, but ther was a moderately severe anæmia with a colour-index of 1 In spite of treatment with arsacetin injections the anæm steadily worsened, myelocytes and normoblasts appear in the peripheral blood, anorexia and vomiting set in, a there was an attack of collapse and unconsciousness lasti two hours. Her hæmoglobin having fallen to 25 per cen her pregnancy was terminated by operation at the six month, some ten weeks after admission. She then ma a rapid and spontaneous recovery, pathological c disappeared from the blood and the anæmia was repaired.

TABLE IV.

Date.	R.B.C.	Hb. %.	Remarks.
Sept. 4th	—	60	Four months' pregnant.
,, middle	3,000,000	60	—
Oct. middle	—	50	—
Nov. 1st	2,000,000	38	—
,, 6th	—	33	—
,, 7th	—	—	Collapsed and unconscious hours.
,, 9th	1,500,000	28	Myelocytes and normobla
,, 15th	—	25	Pregnancy interrupted.
,, 30th	1,900,000	28	—
Dec. 7th	—	35	No pathological cells.
,, 17th	—	45	—
,, 28th	—	60	—
Jan. 10th	3,800,000	64	—

It is usually said that the anæmia becomes progressively worse during pregnancy and reaches a crisis in labour or the puerperium, which is either fatal or is followed by spontaneous recovery. This is certainly true of most of the cases which begin about the sixth or seventh month of pregnancy. Cases beginning before the sixth month often terminate in premature delivery, spontaneous or induced. Patients who have no symptoms till labour or the puerperium may remain anæmic for a long time after confinement, as in the very interesting series of cases described by Larrabee. One of these was

70. Topley, W. W. C., and Wilson, G. S.: The Principles of Bacteriology and Immunity, London, 1929.
71. Vallois, L., et Coll de Carrera: Bull. Soc. d'Obst. et Gyn., 1923, xii., 510.
72. Vermelin, H., et Vigneul, M.: Ibid., 1921, x., 708.
73. Weber, F. Parkes: Proc. Roy. Soc. Med., 1931, xxv., 15.
74. Weinberg, F.: Deut. Arch. f. Klin. Med., 1918, cxxvi., 447.
75. Wery, M.: Bull. Soc. d'Obst. et Gyn., 1930, xix., 601.
76. Wintrobe, M. M.: Proc. Soc. Exp. Biol. and Med., 1930, xxvii., 1071.
77. Wollstein, M., and Kreidel, K. V.: Amer. Jour. Dis. Child., 1930, xxxix., 115.
78. Ederle, W., and Kriech, H.: Klin. med. Woch., 1931, x., 25.

TREATMENT OF CLONIC FACIAL SPASM.

(*a*) BY ALCOHOL INJECTION.

(*b*) BY NERVE ANASTOMOSIS.

BY WILFRED HARRIS, M.D. CAMB., F.R.C.P. LOND.,
PHYSICIAN FOR NERVOUS DISEASES, ST. MARY'S HOSPITAL, LONDON;

AND

A. DICKSON WRIGHT, M.S. LOND., F.R.C.S. ENG.,
SUPERNUMERARY SURGEON TO OUT-PATIENTS, ST. MARY'S HOSPITAL.

TRUE clonic facial spasm is a unilateral, intermittent, or clonic series of contractions of the facial muscles, limited to one side, though not affecting the whole facial musculature to an equal degree. When once developed, spontaneous cure of clonic facial spasm is unknown.

Somewhat commoner in the female sex, the facial spasms are a source of considerable worry to the sufferers from this complaint, especially from the contractions of the orbicularis palpebrarum, or blepharospasm, causing the appearance of winking. Moreover, the sudden closure of the eye may interfere seriously with vision, as in crossing traffic, with consequent danger to life.

The onset of the spasms varies in severity and frequency, some days being comparatively free, while at other times the annoyance is excessive, aggravation being perhaps induced by nervousness or excitement. During sleep the spasms always cease. Usually these commence in the orbicularis palpebrarum, causing blepharospasm, at first slight and not to be distinguished from the intermittent contractions of this muscle which are personally familiar to many of us, and are sometimes spoken of as "live blood," and are especially liable to be brought on by fatigue. In true facial spasm, however, the muscular contractions gradually spread to other facial muscles on the same side, especially those around the angle of the mouth, and ultimately every muscle supplied by the facial nerve of one side may share in the clonic contractions, including the frontalis and platysma, and even the stapedius may be affected, the contractions being accompanied by clicking noises in the ear. This unilateral distribution of the muscular spasms distinguishes clonic facial spasm from spasmodic tic and psychomotor blepharospasm, habit spasms, chronic chorea, and other intermittent grimacing of psychical origin.

Causes of Condition.

The pathology of clonic facial spasm is unknown, though it is probably due to some form of degenerative neuritis, possibly in the neighbourhood of the geniculate ganglion, for in a well-marked case of some years' duration, it is always easy to demonstrate facial nerve weakness, contracture, and overaction on that side. Moreover, occasionally, a moderately severe *facial Bell's palsy* may be followed, in addition to the usual contracture, by well-marked clonic facial spasm (Fig. 1), indistinguishable in type and severity from that which is of gradual onset.

Undoubtedly clonic facial spasm is due to some chronic lesion or degeneration of the lower facial neuron, and is not of cortical origin, as is suggested by Gibson, who considers it as exactly parallel to spasmodic torticollis. In the latter disease the spasm is a rotary movement of the head to one side produced by the contraction of the sternomastoid of one side associated with the posterior rotators on the opposite side, in which several nerves are concerned, and no weakness of these muscles is to be detected between the spasms. In clonic facial spasm the contractions are limited to the musculature supplied by one facial nerve alone, in severe cases practically every muscle, including the platysma and stapedius, being involved.

Local injuries to the parotid region or cheek may also cause clonic spasm later on of some of the facial muscles on one side, probably due to the scarring involving facial nerve branches. No doubt such a case would not benefit by facio-hypoglossal anastomosis, as the scarring is peripheral to the site of the anastomosis.

Hemispasm of the face may occur in *cerebral lesions*, as in general paralysis, the lower quadrant of the face being chiefly involved in the spasm, and occasionally the whole facial nerve may be irritated by the presence of a *basal tumour* causing attacks of facial spasm, as has been observed in cerebellar tumour. Facial spasm has also been many times noted as a sequel to *encephalitis lethargica*.

A very remarkable combination of clonic facial spasm is occasionally met with in paroxysmal *trigeminal neuralgia*, which was described by one of us (W. H.) in 1926.

In one case, a woman aged 58, who was seen in 1921, clonic right facial spasm had commenced 30 years previously, ultimately involving the whole facial musculature of the right side, without any pain until five years before, when typical paroxysmal trigeminal neuralgia commenced. Alcohol injection of the right foramen ovale and foramen rotundum anæsthetised the second and third trigeminal areas and arrested the pain completely, but the clonic facial spasms continued unaltered until the branches of the facial nerve were injected with alcohol at the posterior border of the mandible, two days later. Ten months later, however, the clonic facial spasms were commencing to reappear, though there was no recurrence of the neuralgia.

In another case, a woman aged 52, clonic left facial spasm had developed two years previously, though paroxysmal neuralgia had commenced only five months before she was seen in May, 1916, the painful spasms then being intense, both by day and night. Injection of the Gasserian ganglion was done, which completely cured the neuralgia, which was still absent 5½ years later, though the spasmodic facial twitchings continued unaltered.

The association of clonic facial spasm with paroxysmal trigeminal neuralgia is difficult to understand, as they arise independently, and cure of the one does not affect the other. Yet they are invariably on the same side of the face, which certainly points to some real association and not coincidence. Cushing has described three cases of clonic facial spasm associated with paroxysmal trifacial neuralgia on the same side, in which Gasserian operation did not benefit the pain, but in one of which the pain disappeared after a subsequent section of the facial nerve. We have never met with such a case, though we have seen the associated pain and facial spasm in at least a dozen cases, all of which responded in the usual way to alcohol injection.

Paraspasm, or bilateral clonic spasms of the especially by injection. With other methods of treatment no lasting improvement can be expected before confinement, but the shock of operation is often mortal. It is well to remember that the disease is not so lethal to the mother as was once held, and that the majority of the babies do well. On surveying the literature I have been surprised to learn how often women who seemed moribund have spontaneously delivered themselves and recovered; and I have been impressed by the high mortality of operative interference. The conservative physician will be strengthened in his decision by the following report [8]:—

> The patient was admitted to hospital at the seventh month of pregnancy with a blood count of 750,000 red blood-cells per c.mm., hæmoglobin 25 per cent., colour-index 1·6. She refused treatment and was sent home to die. This was a journey of 70 miles over the rough mountain roads of Greece. Three days after her return she had an easy abortion and quickly got up and resumed her household tasks. She thereupon contracted pneumonia but was back at work again in three weeks, and since then has been in good health.

Discussion.

When we recapitulate the data I have collected we find good reason to separate the hæmolytic anæmias from pernicious and allied anæmias, and to subdivide the hæmolytic anæmias into acute and chronic forms. Acute hæmolytic anæmia and the hæmolytic anæmia of pregnancy differ from pernicious and allied anæmias in the absence of any nutritional or digestive defect, in the fever and general constitutional disturbance, in the regenerative character of the anæmia with reticulocytosis and leucocytosis, in the fluctuations in the resistance of the red cells, and in the self-limited course. They differ from chronic hæmolytic anæmia in clinical features, natural history, and response to treatment. They may be so acute that hæmoglobinuria develops, or they may be subacute and torpid, but death or spontaneous recovery occurs within a period rarely longer than a year. On the other hand we must be impressed by the close resemblance of acute hæmolytic anæmia and the hæmolytic anæmia of pregnancy. Every feature of the one disease is duplicated in the other, and they differ only in the fact of pregnancy. For the peculiar frequency of a disease in youth and in pregnancy we have a parallel in acute yellow atrophy of the liver. For the initiation or recrudescence of an anæmia in pregnancy we have a parallel in the bartonella anæmia of experimental animals, which may only develop under special conditions, such as after splenectomy or after artificial hæmolysis, though the micro-organisms were previously present in the host. There is no valid reason in pathology for the separation of acute hæmolytic anæmia and the hæmolytic anæmia of pregnancy, and every symptom points to their identity.

To-day one can do no more than present this group of cases and demonstrate their natural features and course. If they are due to infection, as seems probable from the clinical picture, we must look for a different organism from the pyogenic cocci, something perhaps more akin to bartonella. I know no other human infection which responds in this way to transfusion or liver, but there is evidence that *Bartonella muris* can be cured by liver.[78] Writers on the hæmolytic anæmia of pregnancy have referred to the acceleration of blood breakdown and repair entailed by pregnancy, and the hæmolysis of maternal corpuscles in the placenta and elsewhere to supply hæmopoietic material for the fœtus. They have felt that hæmolytic anæmia in pregnancy may be a morbid exaggeration of this process, such as I have already described in icterus gravis neonatorum, and the serum has many times been examined for hæmolysins, but without success. It is a possible but unlikely explanation of all these acute anæmias that they are breakdowns of the normal rhythm of erythropoiesis and erythrolysis, comparable with a disturbance in the rhythm of the heart-beat and that the fever and constitutional disturbance are secondary effects. It has been my aim in this lecture not to construct theories, but to bring together a great number of scattered observations and to show the common characteristics of these acute anæmias.

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TREATMENT OF CLONIC FACIAL SPASM.

(a) BY ALCOHOL INJECTION.

(b) BY NERVE ANASTOMOSIS.

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TRUE clonic facial spasm is a unilateral, intermittent, or clonic series of contractions of the facial muscles, limited to one side, though not affecting the whole facial musculature to an equal degree. When once developed, spontaneous cure of clonic facial spasm is unknown.

Somewhat commoner in the female sex, the facial spasms are a source of considerable worry to the sufferers from this complaint, especially from the contractions of the orbicularis palpebrarum, or blepharospasm, causing the appearance of winking. Moreover, the sudden closure of the eye may interfere seriously with vision, as in crossing traffic, with consequent danger to life.

The onset of the spasms varies in severity and frequency, some days being comparatively free, while at other times the annoyance is excessive, aggravation being perhaps induced by nervousness or excitement. During sleep the spasms always cease. Usually these commence in the orbicularis palpebrarum, causing blepharospasm, at first slight and not to be distinguished from the intermittent contractions of this muscle which are personally familiar to many of us, and are sometimes spoken of as "live blood," and are especially liable to be brought on by fatigue. In true facial spasm, however, the muscular contractions gradually spread to other facial muscles on the same side, especially those around the angle of the mouth, and ultimately every muscle supplied by the facial nerve of one side may share in the clonic contractions, including the frontalis and platysma, and even the stapedius may be affected, the contractions being accompanied by clicking noises in the ear. This unilateral distribution of the muscular spasms distinguishes clonic facial spasm from spasmodic tic and psychomotor blepharospasm, habit spasms, chronic chorea, and other intermittent grimacing of psychical origin.

Causes of Condition.

The pathology of clonic facial spasm is unknown, though it is probably due to some form of degenerative neuritis, possibly in the neighbourhood of the geniculate ganglion, for in a well-marked case of some years' duration, it is always easy to demonstrate facial nerve weakness, contracture, and overaction on that side. Moreover, occasionally, a moderately severe *facial Bell's palsy* may be followed, in addition to the usual contracture, by well-marked clonic facial spasm (Fig. 1), indistinguishable in type and severity from that which is of gradual onset.

Undoubtedly clonic facial spasm is due to some chronic lesion or degeneration of the lower facial neuron, and is not of cortical origin, as is suggested by Gibson, who considers it as exactly parallel to spasmodic torticollis. In the latter disease the spasm is a rotary movement of the head to one side produced by the contraction of the sternomastoid of one side associated with the posterior rotators on the opposite side, in which several nerves are concerned, and no weakness of these muscles is to be detected between the spasms. In clonic facial spasm the contractions are limited to the musculature supplied by one facial nerve alone, in severe cases practically every muscle, including the platysma and stapedius, being involved.

Local injuries to the parotid region or cheek may also cause clonic spasm later on of some of the facial muscles on one side, probably due to the scarring involving facial nerve branches. No doubt such a case would not benefit by facio-hypoglossal anastomosis, as the scarring is peripheral to the site of the anastomosis.

Hemispasm of the face may occur in *cerebral lesions*, as in general paralysis, the lower quadrant of the face being chiefly involved in the spasm, and occasionally the whole facial nerve may be irritated by the presence of a *basal tumour* causing attacks of facial spasm, as has been observed in cerebellar tumour. Facial spasm has also been many times noted as a sequel to *encephalitis lethargica*.

A very remarkable combination of clonic facial spasm is occasionally met with in paroxysmal *trigeminal neuralgia*, which was described by one of us (W. H.) in 1926.

In one case, a woman aged 58, who was seen in 1921, clonic right facial spasm had commenced 30 years previously, ultimately involving the whole facial musculature of the right side, without any pain until five years before, when typical paroxysmal trigeminal neuralgia commenced. Alcohol injection of the right foramen ovale and foramen rotundum anæsthetised the second and third trigeminal areas and arrested the pain completely, but the clonic facial spasms continued unaltered until the branches of the facial nerve were injected with alcohol at the posterior border of the mandible, two days later. Ten months later, however, the clonic facial spasms were commencing to reappear, though there was no recurrence of the neuralgia.

In another case, a woman aged 52, clonic left facial spasm had developed two years previously, though paroxysmal neuralgia had commenced only five months before she was seen in May, 1916, the painful spasms then being intense, both by day and night. Injection of the Gasserian ganglion was done, which completely cured the neuralgia, which was still absent 5½ years later, though the spasmodic facial twitchings continued unaltered.

The association of clonic facial spasm with paroxysmal trigeminal neuralgia is difficult to understand, as they arise independently, and cure of the one does not affect the other. Yet they are invariably on the same side of the face, which certainly points to some real association and not coincidence. Cushing has described three cases of clonic facial spasm associated with paroxysmal trifacial neuralgia on the same side, in which Gasserian operation did not benefit the pain, but in one of which the pain disappeared after a subsequent section of the facial nerve. We have never met with such a case, though we have seen the associated pain and facial spasm in at least a dozen cases, all of which responded in the usual way to alcohol injection.

Paraspasm, or bilateral clonic spasms of the median musculature of the face, has been described by Sicard and Haguenau. It is clearly of cerebral origin, and is probably allied to the tics and habit spasms. These are easily distinguished from true clonic facial spasm, which is almost invariably unilateral.

Bilateral *blepharospasm* also is a psychomotor reflex, which may be started by sudden exposure to bright light, or the irritation from conjunctivitis or snow blindness, and it may also become chronic after the emotional reflex of a bout of crying. Sometimes it may be cured by local nerve injection or section, but psychotherapy should always first be employed.

Treatment.

The treatment of clonic facial spasm has in the past been most unsatisfactory. Electricity and massage are worse than useless, as also are blisters and other counter-irritants applied behind the ear. Exposing the facial nerve by open operation behind the angle of the jaw, and then stretching the nerve has been tried in the past, with only temporary success. Simple division of the nerve will arrest the spasm for a time, by producing complete facial paralysis, but recovery is almost certain to take place, owing to some re-establishment of conduction of the nerve-fibres, with consequent return of the clonic spasms. The degree of deformity in the case of a freshly divided nerve in these cases is not nearly so intense as would result in a recent case of total facial palsy from other causes, because, as we said above, there is always present in long-standing cases a certain amount of facial contracture, which diminishes the amount of facial deformity produced by section of the nerve.

Recently, Frazier has advocated his method of dividing by open operation the nerve-fibrils to the orbicularis palpebrarum and corrugator for the treatment of blepharospasm. Incisions are made across the zygoma in front of the parotid, but these must produce at best scars unpleasant for a female subject, and would not affect the spasms of the angle of the mouth or of the remaining musculature.

Alcohol injection of the nerve at its exit from the stylomastoid foramen has been tried, without good results. If the nerve is properly hit, the facial paralysis will be as severe as if the nerve were cut, though recovery will ultimately take place, with recurrence of the clonic spasms. It is by no means an easy matter to inject the stylomastoid foramen, and searching for the foramen is usually a very painful process.

A method of alcohol injection (Schloesser) that has been used by one of us (W. H.) during the last few years with considerable success, though the relief from the spasms may not last more than three to six months, is to inject the two main branches of the facial nerve where they cross the posterior border of the mandible in front of the ear. This can be easily and fairly quickly done, with practice, under local novocain only, with very little pain, and this method has the advantage that either or both of these branches can be injected at will.

If the spasms are limited to the region around the eye, with no clonic spasms of the angle of the mouth, the upper branch only should be injected, and frequently this is all that is necessary.

A fine hypodermic needle is used, and two Record syringes, one filled with 2 per cent. novocain solution, and the other with 90 per cent. alcohol (spir. vini. rect.). A horizontal mark is made with a dermatographic pencil on the skin at the back of the mandible to mark the level of the crossing of the facial nerve over the posterior border of the bone. This is done by pressing the left index-finger in front of the mastoid process and below the external auditory meatus, and then marking the level of the upper edge of the finger. Another vertical line should be drawn downwards to mark the posterior border of the mandible. The hypodermic needle attached to the novocain syringe is now inserted through the skin at the junction of the two lines, and pushed directly down to the posterior edge of the mandible, which should be felt by the needle point. This is then slipped backwards over the posterior edge and directed slightly upwards, and three or four drops of novocain solution injected, moving the needle slightly upwards and downwards.

Then keeping the needle still, the alcohol syringe is fitted on, and after half a minute four or five drops of alcohol injected, moving the needle as before slightly upwards and downwards while doing so, and very slightly deeper than the posterior edge of the bone. Almost at once it will be found that the eyelid cannot be closed against resistance, and increasing weakness of the frontalis and corrugator also develop, while the angle of the mouth remains unaffected. In those cases in which the spasms affect the lower facial muscles also, the needle should now be partially withdrawn and inserted down to the bone pointing slightly downwards, then slipped over the posterior edge, and the injection of novocain and alcohol made as before. At once the muscles moving the angle of the mouth and the orbicularis oris will commence to weaken, and the amount of paresis can be regulated by the amount of alcohol injected.

When both branches of the facial nerve are injected in this way, the resulting facial paresis may be partial or total according to the amount of alcohol injected. It is interesting to notice that in those cases in which clicking noises in the ear accompany the clonic facial spasms, these noises continue after the facial spasms have been completely arrested by the facial paralysis produced. This is because the nerve-supply to the stapedius muscle is on the proximal side of the alcohol injection, being given off within the middle ear. Yet within a day or two these clicking noises always disappear, probably owing to a reflex effect of the nerve paralysis upon the ganglionic nerve centres, inhibiting the efferent discharges from above.

Although the relief from the clonic facial spasms thus produced is immediate, it is unlikely to be permanent, as with the repair of the nerve-fibres the path for the efferent nervous discharges is re-established, and the clonic spasms reappear gradually in three to six months as a rule, though sometimes twelve months or even longer relief is obtained.

NERVE ANASTOMOSIS.

In order to obtain a permanent cure, the facial nerve must be divided, and its peripheral portion permanently separated from the irritable centre above. With that end in view, and in order to avoid permanent facial palsy, nerve anastomosis with the hypoglossal was decided on by one of us (W. H.) So far as we are aware, only two nerve anastomosis operations for facial spasm have previously been recorded. Kennedy in 1899 performed end-to-end anastomosis of the facial and spinal accessory nerve for facial spasm with fairly successful result, and in 1921 Gibson performed end-to-end facio-hypoglossal anastomosis for the same condition. Gibson gives a good résumé of previous work on facial nerve anastomosis, with records of several cases of his own, all but one done for facial paralysis.

In several no recovery was seen until from six to ten months had elapsed after the operation, though good voluntary and associated movements returned and convincing photographs are shown, though it is probable that emotional use of the facial muscles was confined in all to the unaffected side. This is only to be expected when we consider that for the return of such emotional movements it would be necessary for the facial cortical centre to develop new paths for the conduction of impulses to the hypoglossal nucleus, which appears most unlikely to happen, or else that the cortical centre for the tongue movements should develop an association link with the facial centre, that they should work in tandem, so to speak. This theory seems an attractive possibility, and its development may probably be encouraged by persistent and steady practising by the patient, in front of a mirror, of combinations of voluntary movements or emotional movements of the face with various tongue movements.

Our first case, Mrs. A. aged 50, was operated on by Mr. Blundell Bankart in February 1930, employing end-to-end suture, and partial motor recovery of the face has been present for the past eighteen months, with no return of the clonic spasms, from which she had suffered, on the right side, for seven years.

Her present condition shows, of course, hemiatrophy of the tongue, but she does not notice any disability from this. At rest, the face shows very little deformity, but there is so far no return of voluntary power in any of the facial muscles, apart from those associated with synchronous movements of the tongue. During talking, the eyelid is seen to close slightly, and the nasolabial fold to deepen, while if the tongue is pressed forwards against the teeth there is seen strong contraction of the zygomatici and of the orbicularis palpebrarum. Showing the teeth, smiling, pursing up the lips, or wrinkling the forehead show no return yet of voluntary power, and this is only to be expected, inasmuch as it must take much longer for conducting paths to become established between the facial cortical centres and the hypoglossal nucleus, than for impulses normally sent from the hypoglossal nucleus to the tongue muscles to reach the facial muscles through the anastomosis. Such movements should normally commence to appear as soon as the new *hypoglossal* fibres can grow down along the peripheral portion of the divided facial nerve, which appears to be three months, almost exactly.

She has been told to practise daily making facial movements in front of a mirror, and thus to aid the development of independent facial movements should the necessary intramedullary nervous paths of conduction to the hypoglossal nucleus begin to function.

FIG. 3. FIG. 4.

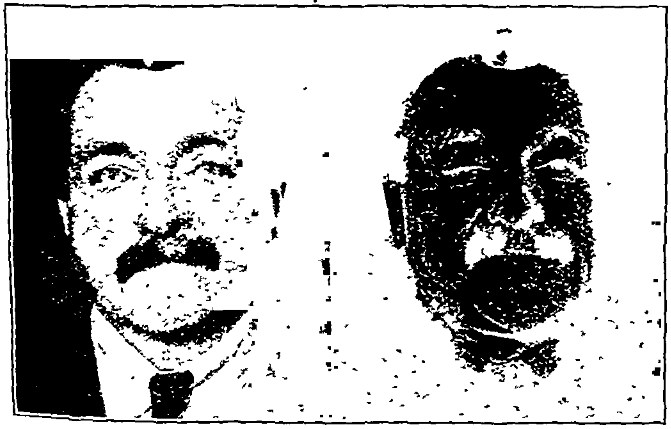

FIG. 3.—Man, aged 51, showing face at rest 10 months after the nerve anastomosis operation.

FIG. 4.—Showing associated contraction of the eyelids and angle of the mouth on the operated side when he pushes his tongue forwards against his teeth.

During the past year four more cases have been operated on by one of us (A. D. W.), 10, 6, 5, and 3 months ago respectively, and of these the first case has been done long enough to report upon, while the second case began to develop associated movements of the eyelid and the angle of the mouth with the tongue at the end of three months. The third case (Fig. 1) has not after five months yet shown any power of contraction of the paralysed muscles, though tonus is returning as she notices her face is much straighter. Even if no further recovery should take place, she is quite pleased to have got rid of the constantly recurring facial spasms. There is plenty of time yet, however, for recovery to ensue, for several of Gibson's and other published cases show an interval as long as ten months before return of power was evident.

FIG. 1. FIG. 2.

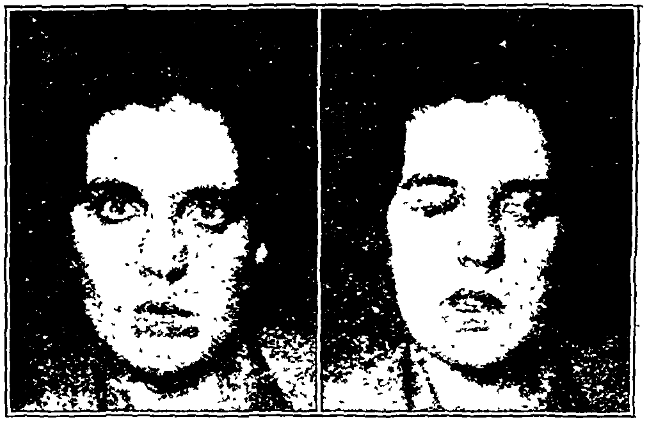

FIG. 1.—Woman, aged 23. Left mastoid operation 11 years ago, immediately followed by complete left facial palsy. Six years later clonic facial spasm commenced at the angle of the mouth, gradually becoming violent. Left facio-hypoglossal anastomosis operation June 29th, 1931. The photograph shows the face at rest, a few days after the nerve anastomosis.

FIG. 2.—Patient is now attempting to smile and to close the eyes. No voluntary or associated movements on the paralysed side have yet appeared.

Mr. B., aged 51, first noticed a twitching in the right lower eyelid in 1915. He could not trace the onset of this to any cause, but from the commencement the twitching has never left him entirely, and has gradually grown worse, until he had great difficulty in getting the eye open at times. He abandoned his trade of shoemaking because he was always being unsighted when the eye closed involuntarily. On testing the facial movements, there was definite slight paresis of all the facial movements on the right side, with overaction and contracture shown when making any strong movement such as closing the eyes forcibly. Spontaneous spasms at times were strong, closing the eye completely, and drawing the angle of the mouth strongly towards the right.

He was operated on, Feb. 23rd, 1931, the technique outlined below being followed. The post-operative course was normal, and he went home on the tenth day, wearing a Jennings splint, with instructions to massage and support his face. From that time until recently he attended the Aldershot Hospital for electrical treatment. At the time of writing many of the facial muscles show a return of movement when the tongue is pressed forwards (see Figs. 3 and 4), especially the orbicularis palpebrarum and the zygomatici, and during speech a slight flickering of the muscles around the eye and the angle of the mouth can be seen synchronous with the tongue movements. Voluntary movements of the facial muscles alone, without tongue movements, are still absent, but the improvement so far is hopeful, and he is very satisfied and pleased to have got rid of the spasms, even if no further voluntary movement should return.

The treatment by division of the nerve is sure to result in abolition of the spasm, but it is essential to endeavour to improve the facial deformity resulting, so that the patient will not consider it a doubtful bargain to have exchanged a facial twitch for a facial palsy, though as already explained, owing to the contracture existing, the facial palsy produced is scarcely noticeable at rest. The surgical problem is somewhat simpler than that of facial paralysis, because the paralysis is produced at the time the anastomosis is made. There is not a long intervening period of time during which the distal part of the nerve and the facial muscles have undergone degeneration.

OTHER METHODS.

The multiplicity of operations suggested for facial paralysis indicates that none is entirely satisfactory. Plastic operations by insertion of fascial or silk loops to correct the sagging of the lower lid, the ala nasi, and the corner of the mouth, are usually reserved for cases where nerve anastomosis is impossible or has been a failure.

Myoplasty is sometimes of value, using muscles with or without their nerve-supply, to correct the drooping of the corner of the mouth and lower eyelid. The temporal muscle, the masseter (Lexer), and sternomastoid (Gomoiu) have been used, and Jianu has suggested using the stylohyoid or the posterior belly of the digastric, because these muscles are innervated by the facial nerve, although they can hardly be regarded as muscles of facial expression. Division of the cervical sympathetic is very favoured by the school of surgery led by Leriche. They argue that the eye changes of Horner's syndrome neutralise the disfigurement of facial paralysis, and even assert that the facial muscles will move on the paralysed side if the cervical sympathetic is cut on that side. Bourguignon has gone so far as to say that the facial nerve sends a branch across the mid-line to the orbicularis palpebrarum, and this nerve produces contractions if the antagonistic sympathetic impulses are withdrawn. In this connexion it is interesting to note that Sicard, Robineau, and Haguenau have reported two cases of clonic spasm of the face treated by simultaneous division of the facial nerve and cervical sympathetic. It is also claimed that the diminution in lacrymal secretion following sympathectomy removes the "unshed tear" appearance which results from facial palsy.

VARIETIES OF ANASTOMOSIS.

Treatment of facial paralysis by anastomosis with adjoining nerves has found more favour in this country, and valuable pioneer work in this connexion was done by Ballance. The nerves suggested for anastomosis are: (1) the spinal accessory in whole or in part (Ballance, 1895); (2) the glossopharyngeal (Schäffer); (3) the hypoglossal in whole or in part (Koerte); (4) the descendens noni or cervicalis or both (Rawa); (5) the cervical sympathetic (Ballance); (6) anastomosis of the facial to the hypoglossal, combined with anastomosis of the ansa hypoglossi to the distal end of the hypoglossal, to neutralise lingual atrophy (Brown).

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Having completed the anastomosis, half of the thickn of the digastric muscle is turned forward as a flap from mastoid process and passed over the nerve, and resutured in place, thus the line of anastomosis lies in the substance of this muscle. It is a well-known fact that muscle is the ideal bed for a regenerating nerve (Robert Jones), and the suture line of the nerve should never be left in fatty or fibrous tissue, as the resultant cicatrisation endangers the regeneration. The perfect closure of the perineurium prevents the wandering of the regenerating nerve fibrils, and also prevents inflammatory cells wandering between the cut ends of the nerve, and increasing the cicatrisation.

An absolutely dry wound is secured before closing the fascia with interrupted fine catgut stitches. The skin incision is carefully sutured with a Halsted's subcuticular stitch and a firm even pressure maintained over the operation field by means of a piece of sponge rubber, cut to fit in behind the angle of the jaw, and kept in place by a bandage. The attention to absolute hæmostasis and the prevention of post-operative collection of serum by firm pressure is of the first importance.

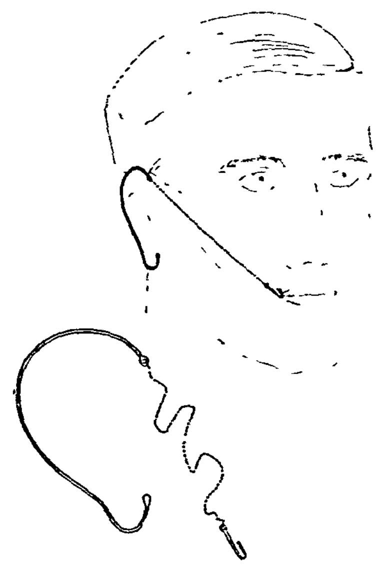
Various reasons for failure of nerve anastomosis have been suggested.

1. Trauma to the nerve ends. This must be prevented by dividing the nerve cleanly at right angles with a knife, because scissors crush before cutting, and by refraining from picking up the nerve with forceps. The best instrument to steady the nerve for the passing of the guide stitch is a Gillies' hook. Once the guide stitch is in position no further manipulation of the nerve is necessary.

2. The formation of a post-operative hæmatoma and collection of serum leading to excessive scar formation may be prevented by accurate hæmostasis and a pressure dressing.

3. Cicatrisation at the site of the anastomosis is reduced to a minimum if the suture line is buried in the muscle. The enclosure of the anastomosis in an excised segment of vein is not regarded as so satisfactory as the burying of the suture line in muscle.

FIG. 7.



Chain and hook splint, made by Hamblin, Wigmore-street.

4. The use of unsuitable suture material. The outcome of war-time experience in man, and experiments in animals (Sargent), seems to point to silk as the best suture material, and naturally the finer the material the less irritation is caused. Chromicised catgut is regarded as most unsuitable for nerve suture.

POST-OPERATIVE CARE.

The post-operative care is of some importance to ensure a successful outcome to the operation. The patient stays in bed no longer than he feels inclined, and is usually walking on the afternoon following the day of the operation. The wound is not dressed until the tenth day, when the subcuticular stitch is removed. At this time galvanic stimulation of the paralysed muscles is commenced, and is continued steadily until facial movements return. It is probably best for the patient to have his own battery, and to treat the muscles two or three times daily for ten minutes. Massage should also be employed by the patient's finger to pull up the lower lid, the ala nasi, the frontalis, and the corner of the mouth, by stroking movements.

FIG. 5. FIG. 6.

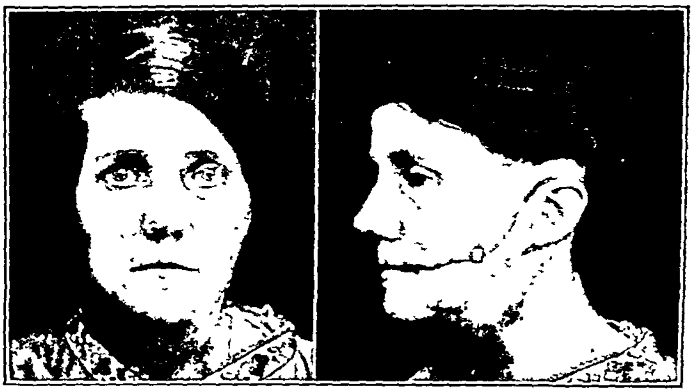


FIG. 5.—Woman, aged 41, showing the face at rest 24 hours after left facio-hypoglossal anastomosis, Nov. 28th, 1931.

FIG. 6.—Patient is wearing a Jennings splint. The scar of the operation in the neck is also shown.

When reading or writing, the elbow should be rested on the table, and the paralysed side of the face supported by the palm of the hand; this is moreover a position frequently adopted naturally. When sleeping, the patient should lie on the affected side to give support to the facial muscles.

A facial splint is of great value (Dennis); either Miss Jennings's splint of German silver wire (Fig. 6) or the chain splint made for one of us (W. H.) by Hamblin of Wigmore-street (Fig. 7). The splint prevents overstretching of the zygomaticus and the levator anguli oris, and also prevents the cheek from puffing out, due to the weak buccinator.

Careful attention to the operative and post-operative details will lead to a measure of success in practically all cases, with a very fair cosmetic result. Gibson, in 1921, and Brown, in 1926, published photographs of cases with very fair results following this operation performed for facial palsy.

In the case of clonic facial spasm, how much more certain must be the outlook for return of facial movement when we are dealing with the freshly sectioned facial nerve and facial muscles in perfect condition, and no previous scarring from inflammation in the mastoid region. We therefore feel that it is justifiable to embark upon the procedure of facio-hypoglossal anastomosis in cases which cannot be sufficiently relieved by alcohol injection, and in which the spasms constitute a great source of annoyance, and even disability to the patient.

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The treatment by division of the nerve is sure to result in abolition of the spasm, but it is essential to endeavour to improve the facial deformity resulting, so that the patient will not consider it a doubtful bargain to have exchanged a facial twitch for a facial palsy, though as already explained, owing to the contracture existing, the facial palsy produced is scarcely noticeable at rest. The surgical problem is somewhat simpler than that of facial paralysis, because the paralysis is produced at the time the anastomosis is made. There is not a long intervening period of time during which the distal part of the nerve and the facial muscles have undergone degeneration.

OTHER METHODS.

The multiplicity of operations suggested for facial paralysis indicates that none is entirely satisfactory. Plastic operations by insertion of fascial or silk loops to correct the sagging of the lower lid, the ala nasi, and the corner of the mouth, are usually reserved for cases where nerve anastomosis is impossible or has been a failure.

Myoplasty is sometimes of value, using muscles with or without their nerve-supply, to correct the drooping of the corner of the mouth and lower eyelid. The temporal muscle, the masseter (Lexer), and sternomastoid (Gomoiu) have been used, and Jianu has suggested using the stylohyoid or the posterior belly of the digastric, because these muscles are innervated by the facial nerve, although they can hardly be regarded as muscles of facial expression. Division of the cervical sympathetic is very favoured by the school of surgery led by Leriche. They argue that the eye changes of Horner's syndrome neutralise the disfigurement of facial paralysis, and even assert that the facial muscles will move on the paralysed side if the cervical sympathetic is cut on that side. Bourguignon has gone so far as to say that the facial nerve sends a branch across the mid-line to the orbicularis palpebrarum, and this nerve produces contractions if the antagonistic sympathetic impulses are withdrawn. In this connexion it is interesting to note that Sicard, Robineau, and Haguenau have reported two cases of clonic spasm of the face treated by simultaneous division of the facial nerve and cervical sympathetic. It is also claimed that the diminution in lacrymal secretion following sympathectomy removes the "unshed tear" appearance which results from facial palsy.

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Having completed the anastomosis, half of the thickness of the digastric muscle is turned forward as a flap from the as indicative of increased functional activity. Other observers have held that the changes are degenerative in nature, but Evans and Simpson[11] have found that bilateral gonadectomy, performed prior to removal of an animal's pituitary for transplantation experiments, increases the potency of such transplants, and Zondek[1] and Fluhmann[3, 12] have demonstrated the presence of prolan A in the urine and blood-serum of patients, after bilateral oöphorectomy. These two facts seem to prove conclusively that the pituitary changes are not degenerative but hyperplastic.

Zondek states that after castration the follicle-ripening hormone can be found in the urine in quantities as large as 150 R.U. (rat units) per litre.

An attempt was made to verify these findings. The result was that, of four patients under the menopausal age who had bilateral oöphorectomy without an ovarian graft, two showed prolan A in the urine after operation. In one, the hormone appeared as early as the eleventh day after castration, but was not present later; in the other, it was not found until six weeks after removal of the ovaries. This small number of cases does not enable one to say at what times the hormone usually appears and disappears; but Fluhmann[3] obtained a positive result as early as the ninth day, and as late as fourteen years after the operation. He also found that the urines from some patients, which had been negative at first, became positive later. In one of my cases prolan A, although present at first, disappeared later; this seems to imply that its occurrence is merely a temporary effect of the general endocrine disturbance.

This variation in the time of the appearance of the hormone is in accordance with the findings of Rössle[13] who observed that the changes in the pituitary developed sometimes as early as five days after castration, while in others a considerable time elapsed before they were manifest.

This over-activity of the hypophysis, since it occurs both at the menopause and after castration, is probably due to the removal of ovarian stimulation. As to what ovarian factor is concerned there is some dispute. Kraul[14] quotes the investigations of other workers which appeared to show that injections of œstrin, after castration, prevented the changes in the anterior pituitary. However, Fluhmann and Kulchar[15] claim to have demonstrated that the appearance of what they call "castration" cells in the hypophysis, is not related to a diminished amount of œstrin. Fluhmann[3] found that the constant administration of the follicular hormone to castrated rats over a period of three months failed to prevent the the typical pituitary changes. But Mahnert and Siegmund[16] observed that injections of œstrin into a normal animal delays ovulation, and since the latter event is now believed to be dependent on the pituitary, it is probable that an excess of œstrin in the body diminishes the prolan A output, and vice versa.

On this assumption, it is possible to explain the periodic ripening of the normal Graafian follicle. When no follicle is ripe, and no œstrin is formed or is circulating in the blood stream, the hypophysis secretes the follicle-ripening hormone. This leads to the production of œstrin which inhibits the pituitary and prevents, for the time being, the secretion of prolan A.

In three further cases which I have studied, the patients were past the menopause before their ovaries were removed, and none of them had any prolan A in the urine—a finding in conformity with the above hypothesis. In three other cases of oöphorectomy the patients had an ovarian graft in the rectus abdominis muscle. One would expect that in these cases pituitary hormone would not have been found in the urine, yet it occurred in considerable quantities in two of the patients. However, inquiries into the operative details of these two cases revealed the fact that in both of them the ovaries were so diseased that only a very small portion was available for grafting. Although in one patient this was sufficient to promote the continuance of menstruation one can imagine that there would be a considerable reduction in the amount of œstrin produced, especially as an attempt was made by the operator to remove the follicle-bearing area from the transplanted ovarian tissue.

It is interesting to note that Fluhmann[3] found that whereas, after operative or radiation castration, at the menopause, and in some patients with prolonged periods of amenorrhœa, the follicle-stimulating hormone appeared in the blood stream, yet in women with scanty and infrequent irregular menstruation no hormone was found. This he attributes to the fact that in the latter conditions, the hypoöphorism is merely secondary to decreased activity of the hypophysis. Again he found prolan A in some cases of menorrhagia and severe dysmenorrhœa; this he explained by assuming that the underlying cause of such condition is increased activity of the anterior lobe of the pituitary.

In view of these findings, and in view of the fact that the urine of pregnant animals never gives a positive pregnancy test (prolan B), it is of interest to know whether prolan A is excreted in the urine of castrated animals or not. Kraul[14] found that the hypophyses of rabbits whose ovaries had been removed produced greater prolan A and prolan B effects when transplanted into immature rats than did those from animals not previously castrated.

In the present investigation the ovaries from six rabbits were removed and specimens of urine were subsequently collected in a metabolism cage and tested on immature mice. One of the rabbits died six days after operation, and so cannot be considered in the assessment of the results. Of the remaining five, it was found that two definitely, and a third doubtfully excreted prolan A in the urine. The hormone was present as early as nine days after operation, but in two of the animals it seemed to be only temporary. One of the rabbits had not reached puberty at the time of the operation and it is interesting to note that the pituitary hormone was found in the urine in this case.

The finding of this hypophyseal hormone (prolan A) in the urine of an animal is remarkable: it at least proves that the pituitary of a rabbit is capable of producing it in quantities sufficient to be demonstrable in the urine.

THYROIDECTOMY.

Schilder,[17] in 1911, first showed that histological changes occur in the pituitary in conditions of thyroid aplasia.

Blair Bell,[18] in 1913, described in detail the hypophyseal changes following thyroidectomy in cats, and concluded that "thyroidectomy causes an increase in the secretory activity of all parts of the pituitary body." However, Bryant,[19] although finding an increase in chromophobe cells in the pituitary of the rabbit after thyroidectomy, does not believe that the activity of this gland is increased. It should be noted that, as Blair Bell stated, the thyroid and pituitary of the cat more nearly resemble these organs in the human subject than do those of the rabbit, in which animal experimental changes are less well defined.

Smith[20] showed that ablation of the anterior pituitary leads to atrophy of the thyroid, and that this effect can be prevented by pituitary transplants. Later, Evans and

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THE OCCURRENCE OF PITUITARY HORMONES IN THE URINE IN CONDITIONS UNASSOCIATED WITH PREGNANCY.*

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SINCE the introduction of the Aschheim-Zondek test for pregnancy, many observers have noted that the so-called pituitary hormones may occur in human urine in conditions other than those associated with pregnancy. Prolan A, in particular, has been shown to be present at the menopause, after castration, and in some cases of malignant disease. It might be supposed that such a possibility would affect the accuracy of the Aschheim-Zondek reaction as a test for the presence of living chorionic elements in the body. One must, however, bear in mind the fact that it is the presence of prolan B, and not prolan A, in the urine which gives a positive result —namely, corpora hæmorrhagica and luteinisation in the ovaries of immature mice.

During the past year 250 tests were made on the urines of 169 male and female patients; some of the latter were pregnant, others not; 77 positive and 136 negative reactions were obtained, while in 37 instances the mice died. A considerable number of these experiments were performed with urines from cases of malignant disease, or from women in whom bilateral oöphorectomy had been performed, yet only two errors were made in the diagnosis of the presence or absence of living chorionic elements in the patient concerned. In these two cases the experimental technique, rather than the test itself, was at fault. The percentage error was 0·94 of the tests in which a result was obtained.

There is now no doubt of the value of the test in pregnancy, and in this communication the occurrence of pituitary hormones apart from pregnancy will alone be considered.

Prolan B.

Zondek [1] claims to have obtained A.P.R. II.† and A.P.R. III. in mice injected with urine from two cases of carcinoma cervicis. Elsewhere he states [2] that prolan B may occasionally be found in the urine after a patient has had both ovaries removed. Fluhmann,[3] using the blood-sera of women at the menopause or after castration, sometimes obtained evidence of the presence of this hormone, while Allan and Dickens [4] reported an error in pregnancy diagnosis which arose because the urine from a patient at the menopause produced corpora hæmorrhagica in the test animals. Hannan [5] obtained a positive Aschheim-Zondek reaction in two cases of genital carcinoma, and Stewart [6] reported a similar finding in a case of hyperthyroidism. Recently Susman and Nuttall [7] have claimed that the urines of 14 out of 18 cases of malignant disease produced a positive reaction. If by this they mean that the urines investigated produced the effects of prolan B in the genitalia of mice, it was an unusual finding, for as Zondek's results show, the occurrence of this hormone is rare as compared with the occurrence of prolan A, in these circumstances.

In the face of such evidence, it is not possible to deny that prolan B can occasionally be found in the urine of non-pregnant women. Still in the tests on which this communication is based there has never been any evidence of the presence of the luteinising factor in the urine, except when the patient has had active chorionic elements in the body.

Prolan A.

In that part of the investigation which concerns prolan A, urines from patients at the menopause and after sub-total thyroidectomy were examined. In addition, urines from human beings and animals suffering with malignant disease, or in whom bilateral oöphorectomy had been performed, were tested. The urines, most of which were previously concentrated by a method described by Zondek,[3] were injected by a technique similar to that employed in the ordinary pregnancy diagnosis tests.

MENOPAUSE.

It is generally agreed that at the menopause there is a gradual cessation of ovarian activity, and an associated readjustment of the endocrine balance in the body. In the light of our present knowledge of the relationship between the pituitary and the ovary, it is difficult to be certain whether the diminished ovarian function is a primary or secondary feature of this process. Whatever be the mechanism of the disturbance, the fact that it occurs is evidenced by the excretion of prolan A in the urine. Zondek [5] reports the presence of the follicle-stimulating hormone in the urine of menopausal patients; he is of the opinion that it appears late in this physiological process. Fluhmann [8] found that at the onset of menopausal symptoms, 33 per cent. of all patients have demonstrable quantities of prolan A in the circulation. At a later stage in, or just past, the menopause, he showed that five out of seven patients had this hormone in the blood stream.

The urines of six women who were at, or about the climacteric have been examined; of these, one killed the mice, three contained the hormone, and two did not. Those patients who excreted the hormone were at the commencement of the menopausal disturbance.

Zondek [8] in discussing the reason for the excretion of prolan A at the menopause says that it must be because the ovaries cannot utilise it, or because the functioning ovary normally inhibits the activity of the anterior lobe of the pituitary. He points out that since hypophyseal transplants will stimulate the senile ovary of a mouse or rat, the first view cannot be accepted, and the second must be the true explanation.

CASTRATION.

Fichera,[9] in 1905, first pointed out that hypertrophy of the pituitary follows removal of both ovaries. Blair Bell [10] confirmed this finding, and described microscopical changes which he regarded examined—that is, 14 per cent.—had prolan A in the urine.

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* This investigation was undertaken on behalf of the Liverpool Medical Research Organisation.

† Anterior pituitary reaction.

A final series of tests were made on rabbits inoculated with the Brown-Pearce tumour. The growth was extensive in each animal whose urine was examined. Altogether, the urines from eight rabbits, the serum from a ninth, and ascitic fluid from a tenth, were tested. In every case a negative result in regard to the presence of prolan A was obtained.

It would seem, therefore, that it is rare to find prolan A in urines of patients suffering with extra-genital carcinoma; only once was it demonstrable in such conditions. On the other hand, its occurrence is common when the malignant disease has its site in the genitalia.

Difficulty is encountered in attempting to explain why malignant tissue should be associated with the excretion of prolan A. It may be:—

1. *That the growth actually manufactures the hormone.*—It is well known that extracts of the human placenta produce in immature mice ovarian responses identical with those which result from the injection of the urine of pregnant women. Moreover, many authorities, including Philipp,[26] Collip,[27] and Bourg [28] are of the opinion that it is the placenta, and not the pituitary, which is the site of origin of the hormones excreted in the urine during pregnancy. If this is true, and since, as Blair Bell [29] has suggested, the behaviour of malignant tissue resembles that of the chorion, then it is reasonable to suppose that the growth may actually produce the hormone. In such circumstances, the individual variation in tumours such as the presence, or absence, of necrosis, or of encapsulation, would explain why the finding of prolan A in the urine is not a constant feature of neoplastic conditions generally. However, even such variations in the tumour do not appear to be sufficient to explain the remarkable fact that the hormone is but rarely found except when the neoplasm is situated in the genitalia. Moreover, in acetone and alcohol extracts which have been made from both human and animal tumours, no hormone has yet been demonstrated.

2. *That the growth may stimulate the pituitary to increased activity.*—In favour of this view, Zondek [1] states that many investigators have found "pregnancy changes" in the hypophyses of patients suffering from malignant neoplasms. More recently, Susman [7] has found histological evidence of increased activity of the anterior lobe of patients dying from these conditions. Berblinger [30] showed that injection of any protein caused pituitary changes, and he considered that in the case of neoplasms the products of tissue necrosis could produce this effect. However, this theory does not account for the fact that in the cases investigated in this series, only *genital* carcinoma caused the excretion of prolan A.

3. *That the increased activity of the anterior pituitary is the cause, and not the result of malignant growths.*—With regard to folliculomata of the ovaries, Blair Bell and Datnow [31] have already suggested that prolan A may be a factor in their ætiology in view of the multiple nature of the primary growths; but regret that they have not had an opportunity of making biological tests in any case of this type. Susman [7] has recently described a treatment for cancer which is based on the theory that the disordered overgrowth of tissues, which occurs in neoplastic conditions, is associated with an increased activity of the anterior lobe, and a decreased activity of the posterior lobe of the hypophysis. However, there is evidence to show that the excretion of prolan A in these cases is the result, and not the cause, of tumour formation. In the two cases of carcinoma corpus uteri which gave positive results, the hormone disappeared from the urine within ten days of hysterectomy. Also, Zondek [1] found that not only did the pituitary hormone vanish from the urine after the removal of the growth, but that it reappeared in the presence of a recurrence.

4. *That the presence of the growth in the genitalia gives rise to impulses which pass from the genitalia to the pituitary.*—It is well known that in the rabbit ovulation occurs about eight hours after coitus. Ovulation is now believed to be dependent on the pituitary, and Fee and Parkes [32] have shown that hypophysectomy, performed immediately after copulation, inhibits the rupture of the follicle in rabbits. It seems, therefore, permissible to assume that the vulva, vagina, and uterus are connected with the pituitary by a hormonal or nervous mechanism. Kraul [14] points out that mechanical irritation of the cervix in animals, or curettage in women, has been shown to produce changes in the ovaries. He states, moreover, that these changes occur even if the ovarian tissue is only present as a graft, and is situated at a distance from the pelvis. From this he infers that the ovarian changes are brought about by the anterior pituitary which is stimulated by impulses, probably nervous in nature, arising in the genitalia. If this be true, it is conceivable that the presence of a growth in the vulva, vagina, or uterus, may act as a local irritant and set up a train of impulses which pass to the pituitary and stimulate it to produce an excess of prolan A. This view will at least explain why prolan A is, for the most part, excreted when the genital tract is the site of the neoplasm. Moreover, the fact that prolan A disappears from the urine after removal of the growth is not incompatible with this theory.

Summary.

1. Experimental results are given confirming the work of other observers who have stated that prolan A can be found in the urine at the menopause after castration, and in some cases of malignant disease.

2. In this series of cases prolan B has never been excreted in the urine except when the patient had living chorionic elements present in the body. In other words, a positive Aschheim-Zondek reaction has never been obtained except in the presence of such elements.

3. It has been shown that prolan A can be detected in the urine of rabbits after castration.

4. Prolan A has also been found in the urine of patients who have had sub-total thyroidectomy performed for exophthalmic goitre.

5. The finding of prolan A in the urine of patients with malignant disease has been almost entirely confined to those cases in which the genital tract was the site of the tumour.

I am indebted to Prof. W. Blair Bell in whose department, and under whose direction, this work has been carried out. My thanks are also due to Dr. M. Datnow for his helpful advice and criticism.

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Simpson[21] went so far as to suggest that the anterior lobe of the hypophysis secretes a separate principle whose sole function is to stimulate thyroid activity. Crew and Wiesner[22] have lately produced more evidence in favour of the presence of a separate thyreotropic factor in the pituitary; this they call the "theta factor." Within the last few months Gant,[23] while working with the *Amblystoma jeffersonianum*, has found that heteroplastic anterior pituitary transplants result in an increased activity of the thyroid gland, and that secretion and discharge of the follicular colloid is stimulated. Silverberg[24] has also shown that injections of hypophyseal extracts stimulate the thyroid in guinea-pigs.

The bulk of evidence therefore points to a thyroid-pituitary relationship which is somewhat similar to that of the ovary and the pituitary. Accordingly it was decided to test whether there is any evidence of the excretion of pituitary hormones following removal or reduction of the influences of the thyroid secretion on the body. Total thyroidectomy cannot be performed in the human being, so patients were chosen who had had approximately five-sixths of the gland removed for exophthalmic goitre. This choice was made since it was felt that such patients, more than any others, would be subjected to an immediate reduction of the thryoid secretion in the body.

Out of the nine cases examined, in three definitely, and in two others doubtfully, a hormone whose action was similar to that of prolan A appeared in the urine following the removal of the greater part of an over-active thyroid. It was present as early as the seventh day, but in one case its occurrence was only temporary. Possibly if the whole gland had been removed, all patients, male and female, would have excreted the hormone. Nevertheless, in the consideration of these results, it must be borne in mind that such cases can hardly be comparable with those in which the thyroid is normal ab initio. It would, therefore, be interesting to perform total thyroidectomy on normal animals, especially cats, and to examine their urine subsequently. This was not done in the present inquiry.

Blair Bell[18] demonstrated increased activity of the thyroid following oöphorectomy; it may now be inferred that this effect is only secondary to the pituitary hyperplasia which follows castration. In the same way it is possible to explain the enlargement of the thyroid which sometimes occurs at puberty in patients with hypoöphorism. The increased thyroid activity during pregnancy may be the result of the large amounts of prolan A, or an associated "theta factor" in the circulation, or may be secondary to a diminished ovarian follicular activity at that time. This view is borne out by the work of Riddle[25] who showed that there is a regression in the thyroid of doves during periods of ovarian activity.

From this mass of evidence one arrives at a possible explanation as to why thyroid therapy has been found to be effective in ensuring the continuance of pregnancy to term in those women who have had a series of abortions and premature labours for no obvious reason. The ætiology of these conditions may be related to an increased prolan A, or œstrin, output. In either case, administration of thyroid should tend to inhibit the hypophyseal activity, and to diminish the secretion by it of the follicle-ripening hormone.

DISEASES OF THE ENDOCRINE GLANDS.

It is possible that pathological conditions of the thyroid, suprarenal, and pituitary might, on occasion, result in the appearance of the hypophyseal hormone in the urine. From what has been said, one might expect that in hypothyroidism prolan A would be excreted; no case of this disease was examined. Three patients with exophthalmic goitre gave negative results prior to operation. A case of diabetes insipidus associated with a posterior pituitary tumour likewise had no demonstrable amount of the anterior lobe hormone in the urine. This result, however, is of very little significance since the urine had such a low specific gravity. No prolan A was found in a case of Addison's disease. Lutein cysts of the ovaries have been reported in association with anterior pituitary tumours (Kraul[14]); these may have been due to an excess of prolan B in the circulation. Other observers have found prolan A in acromegaly; in this investigation the urine and blood-serum of one male acromegalic were tested and gave negative results.

NEOPLASMS.

Benign Neoplasms.—Zondek[1] claims to have demonstrated prolan A in the urine of patients with innocent growths. He found that 30 per cent. of patients who had fibromyomata uteri excreted the hormone, but in no cases of innocent ovarian tumours did he obtain a positive result. I have investigated six patients with fibromyomata uteri and in none was there any evidence of prolan A in the urine. Three cases of ovarian cyst (one dermoid, two cystadenomata) also gave negative results.

Malignant Neoplasms.—Zondek[1] found that in about 80 per cent. of female patients with genital carcinoma prolan A was excreted in the urine. It occurred in amounts as great as 200 R.U. per litre. In cases of extragenital carcinoma, the percentage of positive results was only 36. He also maintains that the presence of the hormone had no relation to the age of the patient, and was not associated with the menopause. Moreover, it was not related to the type of tumour.

In the present investigation the hormonic content of the urine of male and female patients suffering from malignant neoplasms in various parts of the body were investigated. It was found that such urines are exceptionally toxic to the mice. The clinical diagnosis was always confirmed at operation or post mortem.

Of three cases of genital carcinoma in males in which a result was obtained, one definitely had prolan A in the urine, and another probably had small amounts. It would be of interest to investigate a case of so-called chorion-epithelioma of the testis, but no such case has come under notice since this investigation was begun. A result was obtained in ten cases of extragenital carcinoma in males and in none was there any evidence of the pituitary hormone.

Zondek found that 13 per cent. of male patients with malignant disease gave a positive test for prolan A. Taking both of my series together, two out of thirteen patients excreted the hormone in the urine—that is, 15·4 per cent.

Zondek demonstrated prolan A in the urine in almost all cases of genital carcinoma in females. He said that the urines from:

82·5	per cent. cases of	*carcinoma cervicis*	gave positive results.
75·0		carcinoma corpus uteri	
75·0		ovarian carcinoma	
100·0		epithelioma vulvæ	

In the present investigation, 24 tests were made on the urines of 17 patients. In seven of these tests the mice died. The results summarised show that in:

Carcinoma cervicis	16·6	per cent. excreted prolan A.
" corpus uteri ..	66·6	" " "
" vaginæ	75·0	" " "
" vulvæ	50·0	" " "

Of the female patients suffering from extragenital carcinoma and sarcoma, only one out of seven given. Before retiring for the night, such patients as have a history of nervousness or insomnia usually receive luminal or veronal by mouth, to ensure a good night's rest. Cases of diabetes are given insulin just before operation, but even this may be omitted if the case be mild. If chronic pyloric obstruction with cachexia be present, or hypotonia, an injection of pituitary extract just before operation is indicated.

A routine measure in all major operations is the use of morphine or its derivatives. Prof. Finsterer employs omnopon, 0·02 g. one hour before operation, and immediately before 0·015 to 0·02 g. of morphia with 0·0005 g. of atropine. The main purpose of these drugs is to allay apprehension on the part of the patient rather than to utilise their anodynic powers.

During operation.—It is usual to begin the operation by block anæsthesia of the anterior abdominal wall[8] with 0·5 per cent. novocain-adrenalin solution. This is injected through the skin and into the subcutaneous tissues below the proposed site of incision and directly into the recti abdominis. To ensure proper relaxation, 60 to 80 c.cm. of the anæsthetic are used, mostly put into the substance of the muscle. This is carried through to the peritoneum. When the peritoneum has been incised, it is held up by sharp retractors and infiltrated from the inside with 10 to 15 c.cm. of the anæsthetic, on either side of the incision. If this be injected away from the mid-line, it will permit of subsequent painless pulling on retractors, to disclose the field of operation.

The index-finger of the left hand is now introduced immediately below the liver and downwards between the viscera, to the region of the twelfth thoracic vertebra. Here the pulsating aorta is readily felt, and the finger is next pushed slightly upwards until the pulsating hepatic artery is encountered. By firm pressure with the finger-tip, the aorta and vena cava are then pushed apart and a fine needle, 20 cm. long, is guided, above the finger, right down against the bone. Slowly, with repeated aspirations to be sure the needle point is not in a vein, about 50 to 70 c.cm. of the 0·5 per cent. solution are now injected. This is the method of Braun.[9] If blood be aspirated, even in the slightest amount, the needle is immediately withdrawn and mesenteric (root) anæsthesia substituted. The reason for this is that the fluid may be forced through even minute openings in the veins, the result being rapid intoxication. In anæmic and cachectic individuals, only 50 c.cm. of 0·25 per cent. solution are used.

The anæsthetic is usually effective in ten minutes, and lasts from three-quarters of an hour to two hours. In gastric resections the preparation of the duodenum and pancreas is usually completed in one hour, and after that any pain experienced is usually not intense. Nausea and vomiting due to peritoneal irritation, to too rapid absorption of the anæsthetic or, possibly, to the morphia previously given, may occur, but are usually overcome by simply lowering the head. If this be insufficient a hypodermic of caffeine sodium benzoate is generally adequate.

In a publication in 1926 Prof. Finsterer [10] reported 807 cases of major abdominal operation under local anæsthesia as performed by Braun's method. In this series, ether was used only 71 times (8·8 per cent. of cases). Of 468 resections of the stomach reported up to this time, ether was used 33 times (7 per cent. of cases). Those requiring ether received varying amounts of the anæsthetic up to 50 c.cm.

Sometimes ether is essential, as in nervous children, or cases of diffuse peritonitis following perforation of a viscus, where the peritoneum must be swabbed and the mesentery mopped up. Some severe operations, lasting up to five hours, will frequently require ether in the terminal stages, as the effect of the local anæsthetic is not lasting.

AFTER-TREATMENT.

Immediately after operation the patient is put in a partial Trendelenburg position,[11] with the knees elevated in order to prevent thrombosis of the leg veins, dangerous on account of lung embolism. The shoulders are raised so that the patient assumes a partial sitting position, in order to prevent lung congestion.

Where there is cause to fear the onset of post-operative lung conditions, as in overworked labourers or aged individuals with extensive emphysema, it is usual to give transpulmin, a quinine derivative, twice daily, to prevent pneumonia. All patients over 60 receive injections of 2 c.cm. of camphorated oil every two hours for three days to aid expectoration. So many aged individuals have a purulent bronchitis with impaired ability to bring up foul sputum that it has proved decidedly advantageous to take particular care of them after operation. Although all patients receive one injection of pantopon the first night after operation (unless contra-indicated through old age or severe anæmia), the injection is not repeated. It is felt that drugs of this nature tend to inhibit the cough reflex, and in this way to encourage retention of lung secretions. The older patients are encouraged to breathe deeply at all times, and to cough occasionally. When they cough an attendant should support the recti abdominis so that no pain is experienced, and damage to fresh sutures is minimised.

Nausea and vomiting within the first 24 hours after operation are usually due to previously administered morphine or to foul blood in the stomach. The latter should be removed by gastric lavage. Where post-operative hæmatemesis occurs the stomach is immediately washed out with iced water and the manœuvre repeated until the return flow is clear. If at the end of several washings blood is still present, it is best to wash with 100 c.cm. of a 1 in 1000 solution of silver nitrate, a procedure which may be repeated once.

There have been no deaths from operative shock, and no deaths from heart failure, although many of the cases were considered hopeless by other surgeons and were refused operation by them. This fact is attributed to exclusion of deep general narcosis and to efficient after-treatment. It has been observed, in the vast majority of cases, that the general condition of the patient is better and that meteorism and nausea and vomiting are much less than after the use of general anæsthesia.

Only three cases of acute dilatation of the stomach have been met with by Prof. Finsterer in all his cases done under local anæsthesia (over 3600 laparotomies), and these were attributed to chilling of the organs, due to the fact that the operations were performed in cold rooms (war period). They rapidly recovered on stomach lavage.

For post-operative pains from excessive gas-formation, it is usual to give hot air treatment over the abdomen by an arc of electric lights. Pantopon serves only to increase the constipation. The rare cases of severe intestinal atony encountered after the use of local anæsthesia have never proved fatal. They are treated by enemata on the second day, when gas and a small amount of fæces usually pass, and thereafter no treatment is required. In contrast to this are 600 cases done under general anæsthesia by Prof.

OPERATION UNDER LOCAL ANÆSTHESIA:

PREPARATION AND CARE OF THE PATIENT.

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DURING the past 75 years the progress of surgery has been intimately connected with the more or less thorough exploitation of the use of general anæsthetics. As actual preventives of pain, no drugs have, as yet, been discovered which can surpass them in this particular field. And yet their effect on pathological conditions of certain vital organs of the body, such as the heart in myocarditis, the lungs in caseous tuberculosis, and the kidneys in the various forms of nephritis prevent their use in countless numbers of people.

In order to eliminate diseased conditions where a general anæsthetic is to be employed, it is necessary to perform certain examinations and tests on the patient. Usually the first approach is the general physical examination of all the systems of the body, with particular emphasis on the condition of the heart and the blood pressure, and a thorough inspection of the lungs. Where the general survey of the patient leaves any doubt as to the functional ability of any of the main organs, the careful surgeon will demand, on certain of his cases, electrocardiograms, basal metabolic determinations, chest radiograms, or kidney function tests. Even urine cultures are frequently demanded. Urea-concentration tests are desirable also, for it has recently been shown by Haines and Milliken[1] (also F. Stephen[2] and J. Minnit[3]) that in prolonged ether-anæsthesia the excretion of the anæsthetic by the kidney actually causes a tubular degeneration, with partial disintegration of the epithelial cells and consequent post-operative rise of blood chemistry values. Hæmoglobin valuations, erythrocyte counts, and blood groupings are regarded as more or less routine measures in all the severer operations.

Abel[4 5] has recently advocated as immediate pre-operative requisites the following measures: at least two days' complete rest in bed; glucose given as barley sugar or orange juice, to keep up carbohydrate metabolism in order to fight off tissue insult; a sedative hyoscine possibly to be preferred the night before operation to ensure good sleep; blood transfusion if the hæmoglobin determination be below 50 per cent., or if the erythrocyte count be lower than 4,000,000 per c.mm.; glucose and insulin pre-operatively in cases of diabetes; and in the hæmorrhagic states, such as icterus or hæmophilia, 10 c.cm. of 10 per cent. calcium chloride intravenously combined with 15 units of parathyroid extract.

Lambret,[6 7] before the French Surgeons' Congress in October, 1930, recommended a simple diet before operation consisting of plenty of fruit and vegetables, very little meat, and no alcohol; thorough evacuation of the intestines should be accomplished by means of enemata, but aperients should be discouraged; if the urea content of the blood be over 0·5 g. operation is to be avoided, while in decompensated cardiac cases only urgent operations should be permitted; in chronic alcoholism alcohol and opium are given before operation to prevent delirium.

Neumann (Brussels) requires that his patients rest in bed before operation, and he gives them plenty of fruit juices, and infusions of physiological saline; for the last five days before operation, only a milk diet is permitted. De Fourmestraux emphasises the importance of oral and dental treatment which, if neglected, might lead to pneumonia. Pauchet prepares obese patients for operation by ordering complete rest in bed for a week, and giving them only a fruit and lemonade diet. Rowntree[4] even goes so far as to advocate a special pre-operative ward, to contain beds in charge of a physician well acquainted with surgical risks.

The trouble and expense involved in all these procedures appear essential in the preparation of cases for general anæsthesia. However, by introducing local anæsthesia into the field of major surgery, a large number of the surgeons of Continental Europe have, in one move, almost entirely eliminated these procedures. In the hands of English-speaking surgeons, the potentialities of local anæsthesia have never been thoroughly exploited. We may arrive at some idea of the economy of both labour and expense by a perusal of the experience of Prof. Finsterer of Vienna in his work with local anæsthesia during the past 20 years.

A TYPICAL OPERATION UNDER LOCAL ANÆSTHESIA.

If we choose as a typical major abdominal operation that of gastric resection[8] for duodenal or gastric ulcer, we may better visualise the procedure involved in caring for the patient. This operation requires from 1½ to 2½ hours, and in suitable cases is done entirely under local anæsthesia.

Before operation.—No condition of the heart, kidneys, or lungs contra-indicates operation. Hence accessory aids to diagnosis, such as electrocardiograms, chest radiograms, blood chemistry valuations, and kidney function tests, are all eliminated. Once the diagnosis of duodenal or gastric ulcer has been decided upon,* and operation deemed essential, other details of physical examination of systems outside the gastro-intestinal tract are of secondary importance. Only obvious factors which would contra-indicate major operation under general anæsthesia are taken into consideration. Examples are: extremes of anæmia, obvious by the pallor, where the hæmoglobin determination is below 25 per cent. or where the erythrocyte count falls below 2,000,000 per c.mm. In such cases it is found that the patient shows better recuperative powers if treatment be given after operation. It is usual, therefore, to transfuse such patients with 500 c.cm. of blood immediately post-operatively. Jaundice and cases of known blood dyscrasia are usually treated before operation. Icterus subjects receive one-third of an erythema dose of X rays over the spleen within four hours before operation. Beyond this time, e.g., in one case of Prof. Finsterer's where X rays had been given 20 hours before operation, there is extremely little bleeding to be seen during operation from cut vessels, with obvious difficulty in ligating; the danger of post-operative hæmorrhage in such cases is, of course, great. In addition, such cases of jaundice receive calcium chloride or horse serum intravenously before operation. When post-operative bleeding is suspected, these patients receive blood transfusions.

It is usual to ask the patient to arrive at the hospital the night before operation. No period of rest or building-up is required; nor is glucose deemed necessary to fight off the effects of tissue damage. An aperient of magnesium sulphate or castor oil is

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* The usual methods in arriving at this diagnosis are, of course, employed, i.e., history, physical examination, gastric analysis, fluoroscopy and X ray, stool analysis, &c.

The amount of fluid which should be withdrawn is generally regarded as being the maximum that can be obtained. There is little doubt that this is the correct procedure in the acute stage of the disease. As Krasnogurski pointed out, the decrease of the pressure in the ventricular system is the natural incentive to the flow of cerebro-spinal fluid and this is of great value in treatment, since the child absorbs a good deal of cerebro-spinal fluid. When, however, the acute stage of the disease is over and the patient is still secreting an abnormal quantity of cerebro-spinal fluid, the question arises whether the withdrawal of the maximum quantity of fluid is the best method of treatment as possibly a greater stimulus to further secretion might be given than is desirable. This possibility was borne in mind in the treatment of the following case.

Of four cases of cerebro-spinal meningitis admitted last ear to the Ilford Isolation Hospital three recovered. The rst three were all of the toxic variety with purpuric rashes nd were all due to type I. meningococcus. The first of these was treated with an antimeningococcal serum probably eficient in anti-endotoxic action, for it had no specific ffect and the patient died. The next two cases were reated with another brand of serum which had an immediate nd specific effect; both patients recovered with great apidity.

The fourth case, a boy aged 8 years, was admitted to hospital with a history of influenza for 14 days with omiting, headache and cough, pains in the limbs, and nasal ischarge two days before admission. When admitted he as conscious, with flushed cheeks, marked head retraction, Kernig's sign + both sides, retracted abdomen, T. 101·4°, . 84, R. 22. Lumbar puncture was performed and 25 c.cm. f turbid fluid were withdrawn. The report on the fluid howed no sugar, albumin +, pus cells, and meningococci nagglutinable to type sera I., II., III., and IV. Five c.cm. f antimeningococcal serum were given intramuscularly in desensitising doses commencing with 0·1 c.cm.; finally 5 c.cm. of antimeningococcal serum were given intrathecally.

During the next ten days lumbar puncture was performed aily and a total of 120 c.cm. of antimeningococcal serum as given intrathecally and 55 c.cm. intramuscularly. After he first punctures a general anæsthetic was given not only ith a view to the comfort of the patient, but as pointed ut by Flack [5] the amount of fluid can be increased by this means.

At the end of this period the fluid still showed many polymorphonuclear cells with many intracellular meningococci. It would appear that the serum had little if any specific action in this case. The temperature from admission to March 10th was remittent in character; from March 11th to the 15th it was intermittent. It remained subnormal from March 23rd to April 3rd. The fluid on March 24th was clear and sugar was present in it on March 27th. On March 31st 10 c.cm. of clear fluid only were removed, pparently not under pressure.

Lumbar puncture, which had been continued daily, was iscontinued for the first three days in April. This was followed by a relapse; the temperature rose to 103°; the patient had headache and vomited. The lumbar puncture which was performed showed fluid under pressure and 35 c.cm. f clear fluid were removed. Lumbar puncture was continued daily; the temperature fell, it remained a little unsettled or two days. On April 10th he had another relapse; he vomited and his temperature was raised to 103° and remained above normal for three days. The cerebro-spinal fluid was still under pressure. It was decided to estimate the pressure of the cerebro-spinal fluid by a Greenfield's manometer and only to remove a sufficient quantity of fluid to reduce it to normal.

The estimations were commenced on April 29th. On his day the pressure was 300 mm. The process was repeated daily for 21 days. On May 1st the fluid showed no polymorphonuclear cells, no meningococci, protein slight trace, globulin absent, sugar normal.

The boy's condition slowly returned to normal. The pressure of the fluid remained high, but on May 29th the withdrawal of 18 c.cm. of fluid was sufficient to reduce it to normal. Lumbar puncture was discontinued on this date. On June 9th his temperature rose again and as the Kernig was still +, lumbar puncture was done. Only 10 c.cm. of normal clear fluid not under pressure were removed; the fluid showed no meningococci and no excess of protein. The cause of the rise in temperature was a myalgia.

From this date onwards no further lumbar punctures were performed and the boy made an uninterrupted recovery and was discharged on June 27th after a period of over 17 weeks in hospital, 78 lumbar punctures having been performed, and a total of 2601 c.cm. of cerebro-spinal fluid having been removed. After a period at a convalescent home he returned to school and is normal in health both physically and mentally.

The interesting points in the case are: (1) the length of time during which the cerebro-spinal fluid was secreted in excess amount, two "relapses" occurring; (2) the large number of lumbar punctures required (78) to effect a cure; (3) the importance of this treatment in view of the aberrant form of meningococcus found, the poor specificity of the serum as well as the continued high pressure of the cerebro-spinal fluid; (4) the attempt made to lessen the effect of overstimulation of the secretion of cerebro-spinal fluid by measuring the pressure and withdrawing sufficient only, when the fluid became clear, to bring the pressure to normal.

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A CASE OF ACUTE ANÆMIA DURING PREGNANCY.

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AND
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WE think this remarkable case is worthy of record as an example of a rare form of pregnancy toxæmia which has very seldom been reported in England.

The patient, a well-nourished woman of 25, was first seen in private practice on Nov. 9th, 1931. She had had one child, born uneventfully sixteen months before, and she was now pregnant again, about seven months according to her own calculations. She had not felt well since the onset of the pregnancy and she complained of a "cold and cough."

She looked very ill. The temperature was normal and the pulse-rate 110. There was marked anæmia, as shown by the extreme pallor of the lips and conjunctivæ, and there was extensive œdema involving the face, upper and lower extremities, and, to a lesser degree, the abdomen and back. A systolic murmur was audible over the præcordium but the lungs appeared normal. The throat was much injected and this undoubtedly was responsible for her cough. She was a heavy smoker. The duration of pregnancy, as judged by the height of the fundus uteri above the symphysis pubis, was little more than six months. Fœtal parts could be felt and the fœtal heart was heard. The urine was clear and the specific gravity was 1025. Apart from a slight trace of albumin there was no other abnormal constituent present.

Eliminative treatment was instituted and the patient put on a fluid diet. Definite improvement followed and by the fourth day there was marked diminution in the œdema but the pallor remained. On the fifth day she became suddenly worse, with pain in the back and legs, and great breathlessness. She was immediately sent to the Middlesex Hospital.

She was admitted at 8.40 P.M. on Nov. 15th, and seen by Mr. Frederick Roques. She was profoundly anæmic and the pupils were widely dilated and reactive to light. The pulse was running in character and individual beats could not be felt. The temperature was 96·5° and the respiration was rapid, about 50 to the minute. Air-hunger

Finsterer where two proved deaths from atony of the gut were observed, and three probable fatalities. In cases of chronic constipation or morphine addiction, where drugs are required post-operatively, meteorism is combated by warm air applied to the abdomen, washing out of intestines with warm water at 40° C. and injections of pituitary extract two or three times daily.

It is believed that these post-operative precautions avoid complications. In 1312 cases of gastric resection for gastric or duodenal ulcer (up to 1930) there have been only three deaths from pneumonia and two cases of pulmonary embolism.

Apart from these measures against specific disorders, general principles are followed, which aim at the general building-up of the body resistance. For the first 24 hours the patients receive only fluid, in the form of a Murphy drip, either saline or 5 per cent. glucose. In the next 24 hours they have a tablespoonful of alkaline mineral water, or cold tea by the mouth every hour. If there be no vomiting after 48 hours, they receive tea with small amounts of milk, in gradually increasing doses. After the fourth day the diet becomes semi-liquid, consisting of gruels, purées, mashed potatoes, thin cream of wheat, honey, and tea with milk. At the end of about the second week, finely ground-up meat is added. The post-operative diet in cases of duodenal ulcer is very strict, as there usually remains a chronic gastritis which must be given time to heal.

RESULTS.

The results obtained in the employment of the measures outlined above in the hands of proficient English-speaking[12] surgeons should coincide closely with those of surgeons of continental Europe. Certainly the statistics of Prof. Finsterer in his large series of cases appear amply to justify the routine adoption of local anæsthesia in all major abdominal surgery.

Follow-up statistics of resection for gastric ulcer[13] from 1911 to 1923 show 105 cases, with complete cure in 98 per cent. There were no dietary limitations, all gained in weight, and all were able to do hard work. Two of the cases complained of heartburn and eructations when they ate certain foods. Of 236 resections for duodenal ulcer performed from 1916 to 1923, 94 per cent. have been cured. Only one case of proved jejunal ulcer was demonstrated after gastric resection, and this was cured by reoperation with a more extensive removal of the stomach remnant. It is believed that good end-results ensue only when a large part of the stomach has been removed and retrograde filling prevented by attaching the afferent loop high up on the lesser curvature.

One criticism of this operation (von Haberer) is that full meals cannot be taken because such small stomach remnants are left. Symptoms in such cases are palpitation, dyspnœa, fullness and nausea. This may occur in the first few weeks following the operation, but if the patient lies down for ten minutes after each meal, such symptoms rapidly disappear. After two to three months the jejunal loop shows immense compensatory enlargement, so that after that time full-sized meals may be taken without discomfort. It must be emphasised that moderation in diet is essential for two or three months, but after that the patient may eat any food. Opposite to this is Moynihan's advice after gastroenterostomy, where he advocates careful dieting at all times.

Arthur Hurst[14] indicates the danger of diarrhœa following resection of the stomach. The probable cause would be inability of the acid barrier of the stomach to cope with pathogenic micro-organisms from the mouth, so that enteritis or colitis may arise. Up to the present time Prof. Finsterer has had only two cases of diarrhœa following all his resections, and the condition was present only when the patient ate certain foods. As to whether or not micro-organisms may readily pass through such a stomach where so little acid is present, later to penetrate bile-ducts, pancreatic ducts, or invade the gut wall to serve as foci of chronic infection—there is no evidence to show any greater incidence of long-standing sepsis among those with stomach resection than among ordinary individuals.

Only one, doubtful, case of pernicious anæmia following resection has been seen in Prof. Finsterer's cases. Here the internists said the blood picture and the symptoms were not those of true pernicious anæmia, while the pathologist claimed that the bone-marrow picture was typical of Addisonian anæmia.

The efficacy of splanchnic anæsthesia to inhibit pain in major abdominal surgery appears to be well established. The writer has observed many cases fall into a peaceful slumber during the course of the operation. From a purely mercenary point of view, it appears essential for the larger hospitals to dispense with the use of general anæsthesia whenever possible and to substitute local anæsthesia. Finally, when one sees patients who have had the stomach resected the previous day sitting up in bed reading, or asking why they are not permitted real meals to appease their hunger, one wonders if local anæsthesia should not be more universally employed from a purely humanitarian point of view.

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Clinical and Laboratory Notes

A CASE OF CEREBRO-SPINAL FEVER.

RECOVERY AFTER SEVENTY-EIGHT LUMBAR PUNCTURES.

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ONE of the difficulties occasionally experienced in treating cases of cerebro-spinal fever is the continued increased secretion of cerebro-spinal fluid, which may go on during convalescence. Foster and Gaskell[1] have described a case in which the illness ran a prolonged course of over two months, 32 punctures in all being performed; the condition in this case, clinically, was such as to give rise to the fear of hydrocephalus and on this hypothesis lumbar puncture was vigorously persevered with and the patient recovered completely. The importance of repeated lumbar puncture is well recognised. It was emphasised in 1905 by Lenhartz,[2] who pointed out the desirability of measuring the pressure of the fluid, and of not removing more than 50 c.cm. at one puncture. Neale[3] has also commented on the importance of lumbar puncture for the relief of pressure during convalescence and in three of her cases 20, 10, and 17 lumbar punctures were carried out. Krasnogurski[4] has treated cases of suppurative meningitis with increased pressure and compression phenomena by temporary spinal drainage by means of a thin silver tube.

He lay quiet and lethargic for four days, incontinent f urine and fæces, and masturbating openly and frequently. le then became less drowsy and would speak willingly, ith a dull smile. He tended to be fatuous in his replies, ying he had been sent here by some fool, and was really s well as anybody. Now and then he would sing loudly. he left pupil was now larger than the right, and there were apid nystagmoid movements of both eyes on looking to the ght. The tendon reflexes of his right arm were more active an those of the left. Five days after admission he was ized with hiccough which lasted for half an hour. He as transferred to King's College Hospital a week after dmission, under the care of Dr. Kinnier Wilson, and his ondition is at time of writing, 14 days later, in all essentials nchanged save that he is now orientated for time and place. e has no memory of having been admitted to the Maudsley ospital and says that he was taken to the ward in which e now lies because he had pneumonia.

It will be seen that both these patients presented ymptoms *suggestive of an encephalitis*. There was o evidence that this was a secondary encephalitis ccurring in connexion with disease of the meninges r with a local or general systemic infection. Neither as there evidence that it was a primary encephalitis ssociated with poliomyelitis. When it is considered at both patients became lethargic during a febrile ttack and showed a lymphocytosis and an increase f protein in the C.-S.F., while one patient had iccough and the other a disorder of sleep-rhythm, ese facts, together with the neurological findings escribed above, appear to make the diagnosis of cute epidemic encephalitis a probable one. Again, e patients manifested the form of mental disorder hich may be seen in toxic-confusional states (where, s is known the form of memory disturbance characteristic of the Korsakow symptom-complex may occur), nd for such a toxic-confusional state no other cause ould be found.

Even had there not been the findings described it of interest that Delater and Rouquier[1] describe ow a patient of theirs became disorientated in time nd space after a febrile attack, presented no physical gns, and was found to show the changes characteristic of encephalitis lethargica in his brain at autopsy, hile Kirby and Davis[2] in a review of the subject ress that during an epidemic of encephalitis many ases of acute psychosis are *not* recognised until ost-mortem as having been cases of this disease.

The most common mental manifestations of acute pidemic encephalitis described in the literature are a omnolence deepening into stupor and a restless isorientation with hallucinations. Catatonic maniestations have been frequently observed. Though are, the occurrence of the memory disturbance haracteristic of the Korsakow symptom-complex is lescribed by Kirby and Davis[2] and by Abrahamson,[3] while Hesnard[4] speaks of definite "Formes Korsaowiennes" in acute encephalitis making the important oint that the true Korsakow syndrome is not nanifested in that the patient does not show peripheral euritis. Climensko[5] gives the case-history of one of is patients who was brought to him as "not right in is mind." He had a history of diplopia and of high emperature, and when seen had ptosis. This patient, who confabulated freely, made a good recovery in four weeks.

The excellent recovery made by the first of the two cases described, who left the Maudsley Hospital with no evidence of intellectual deterioration, despite having manifested mental symptoms of a gross organic kind six months before, appears to be in no way unusual. Kirby and Davis[2] were unable to find evidence of organic mental impairment in the great majority of their cases on discharge.

Had the two cases described occurred at a time when many cases of acute epidemic encephalitis were being reported, as for instance in 1918, their chief interest would have lain in the type of mental disorder manifested. To-day they raise the question as to whether similar cases are occurring at the present time, toxic-infective mental states which as has been said show few or no physical signs of organic involvement and tend to make a good recovery. It will be of interest to follow the after-history of these two patients, as the development of the familiar sequelæ of lethargic encephalitis would confirm the diagnosis.

I am grateful to Dr. E. Mapother, medical superintendent of the Maudsley Hospital, for permission to publish these cases, and to Dr. A. C. D. Firth and Dr. Kinnier Wilson for their kindness in allowing me to make mention of the progress of these patients while in King's College Hospital.

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NEW INVENTIONS

BRONCHOSCOPIC APPARATUS.

In *a recent paper*[1] we *mentioned* that we would shortly publish a description of a bronchoscope and accessories which we have had constructed for our special work in diagnosis and treatment. We found that the existing instruments each of them failed in one direction. The Haslinger bronchoscope, whilst giving ideal forward illumination with a clear vision to the terminal branches of the lower lobe bronchi, was unsatisfactory in cases of bronchiectasis and abscess, since no arrangement for drainage could be adequately added; the pus coughed out on introduction not only incommoded the operator, but obscured the mirror, rendering further observation difficult. The Jackson instrument, whilst giving adequate drainage, failed in its lighting capacity; the illumination is local and in looking down the bronchial tree one had to look through the globe of light and got very poor illumination beyond. In addition to this the Jackson instrument on account of this defect in lighting was not satisfactory for use with a telescope, neither could a telescope be conveniently adapted to the Haslinger.

The use of a telescope has not been favoured by laryngologists generally, but we may point out that without this aid vision can only be continued in parallel lines corresponding to the bore of the tube, the object to be viewed must be brought into this comparatively small area, vision up the branch bronchi is almost impossible except by excessive manipulation of the tube. By placing one's eye at the *distal* end instead of the proximal—by means of a lens—a wide view angle is obtained so that it is possible to see well up the openings; moreover, a truer view of the colour and condition of the mucous membrane is obtained. By use of a retrograde telescope a view up the upper lobe bronchus can be obtained so that the terminal branches may be examined; we imagine that we are the first to have had this view of the upper lobe bronchus and its branches in the natural position.

The new bronchoscope resembles the well-known Chevalier Jackson instrument in general appearance. The shape was marked and she was very restless. The heart was enlarged and the heart sounds clear but weak; adventitious sounds were not heard. The blood pressure was 120 mm. Hg. Moist râles could be heard all over both lungs. The abdomen was soft and the liver and spleen could not be felt. She did not complain of any abdominal pain or tenderness. The fundus uteri was at the level of the umbilicus and fœtal parts were readily felt but the fœtal heart could not be heard. The cervix was dilated to two fingers and there was no external hæmorrhage. There was a slight trace of albumin in the urine.

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[1] THE LANCET, Jan. 30th, p. 224.

The patient thus presented an almost typical picture of a severe internal hæmorrhage, save for the absence of abdominal signs and she was taken to the theatre, but died before the abdomen could be opened.

A post-mortem examination was performed by Sir Bernard Spilsbury and the findings were as follows:—

The heart was dilated and showed extensive fatty degeneration of its muscle. The lungs were very œdematous and the liver and spleen were only slightly enlarged. Histological examination of the liver showed the presence of free iron and some fatty degeneration of the liver cells. The kidneys were normal apart from some slight swelling of the cortex and the ureters were both somewhat dilated. The uterus contained a complete and unruptured gestation sac and the placenta was normal and not detached. The fœtus was well developed and weighed 3 lb. The cervix admitted three fingers.

Sir Bernard Spilsbury expressed his opinion that death was due to severe anæmia, but that the cause of the anæmia was obscure. Unfortunately the patient's condition precluded an examination of the blood before death nor was the bone-marrow examined afterwards; but the probability is that the condition was due to the presence in the blood of some toxin derived from the pregnancy which produced acute destruction of the blood corpuscles and inhibited blood formation.

Our reason for placing on record a case so incomplete in regard to laboratory detail is to emphasise the necessity for carrying out simple hæmatological investigations as a part of good antenatal work.

We are greatly indebted to Sir Bernard Spilsbury for his report.

ACUTE ENCEPHALITIS AND THE KORSAKOW SYMPTOM-COMPLEX.

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The two cases described are of interest in that they both occurred within the last six months of 1931 and that both patients were disorientated and manifested the memory disorder characteristic of the Korsakow symptom-complex together with a history and clinical and laboratory findings strongly suggestive of acute epidemic encephalitis.

Case 1.—The first patient, a single woman of 54, was admitted to the Maudsley Hospital from King's College Hospital in August of last year with a history that she had taken to her bed five weeks before with a sudden pain in the back of her head and a temperature of 103°. This pyrexia continued for some days. Prior to her admission to hospital her temperature had begun to rise at night. By night she was wakeful and restless, by day she was drowsy. Her body muscles twitched, and she was obstinately constipated.

On admission to King's College Hospital, three weeks after her illness began, she became afebrile. Her abdominal reflexes were absent and both plantar responses were extensor. She is reported to have shown a transient diplopia on the day of her admission. Her memory for recent events was poor and she remained restless at night. The cerebro-spinal fluid (C.-S.F.) contained 20 lymphocytes per c.mm. and 275 mg. of protein per 100 c.cm. Chlorides were not diminished, sugar was normal, neither tubercle bacilli nor other organisms were found, and the fluid was sterile on culture. The Wassermann reaction of her blood and C.-S.F. was negative.

On admission to the Maudsley Hospital she lay with her head flexed off the pillow and her eyes closed. When asked to open her eyes she would do so, and having replied to a few questions in a dull, slurring, expressionless voice she would quickly close them again. Her face was pale and wasted and her expression vacant and apathetic. Her left pupil was larger than her right and both were dilated, her abdominal reflexes were absent, and she had a left extensor plantar response. The muscles of her neck, thorax, and abdomen showed a quiet myoclonic twitching. There was no evidence of meningeal involvement. In the C.-S.F. the lymphocytes had fallen to 16 per c.mm. The protein was now 57·5 mg. and the Lange curve 4 4 4 4 3 2 1 1 0 0. There were no abnormal findings in her urine and the blood-urea was 13·8 mg. There was no agglutination to organisms of the typhoid-paratyphoid group.

Seen within ten minutes of entering the ward she had no memory of her journey, believing herself to be in her bed at King's College Hospital. She was also disorientated for time, and perseverated in her replies. She was not aphasic, and recognised common objects. She was slow, clumsy, and hesitant in her movements. Seen an hour later she believed herself to be in the Weir Hospital, Streatham, and had no memory of having seen me before. As night fell she became restless, and made repeated attempts to leave her bed.

There was little change in her condition till four days later, when she sat up in bed with flushed face and told me of her long walk to the hospital the night before, and of how she had helped herself along with a stick. She greeted a patient who sat near her bed as an old friend from Southampton, and commented sympathetically on the change in her appearance. She failed grossly in simple calculations, and was unable to repeat simple stories. Her manner was cheerful and pleasant, at night she remained restless. There was no change in her physical signs. She was incontinent of urine and fæces for her first ten days in hospital.

Fourteen days after admission the left pupil remained larger than the right, and the abdominal reflexes absent. Plantar simulation no longer evoked an extensor response. Her disorientation persisted and she continued to manifest the memory disorder characteristic of the Korsakow symptom-complex, greeting me as her family physician and describing how I had first seen her in the drawing-room of her own house.

The patient now began to make slow but steady progress, gaining weight and occupying herself quietly with knitting. Her memory defect gradually cleared up, and within three months of her admission she was correctly orientated in space and time. At no time had there been evidence of hallucinations.

Upon her discharge six months after her illness began, she was in good physical health and presented no physical signs suggestive of organic nervous disease. There was no evidence of recent memory defect, there was no confabulation, she was able to perform calculations accurately, and in general presented the picture of a quiet, pleasant, educated woman. It is hoped to keep in touch with her in the out-patient department.

Case 2.—A boy of 16 was admitted to the Maudsley Hospital in January of this year. Four weeks before he had complained of feeling ill and drowsy, and was thought to have had a cold. His temperature was 100°. He remained drowsy for a week, and his parents describe him as having then become "peculiar" and "delirious." His temperature was 100° on the evening before he came into hospital.

On admission he lay quietly in bed with his eyes shut. Asked to open them he would do so, look vacantly around him and ask to be allowed to sleep. His voice was dull and monotonous. Though he lay curled up in bed there was no evidence of meningeal involvement. The C.-S.F. contained 20 lymphocytes per c.mm. and 70 mg. of protein per 100 c.cm. Neither chlorides nor sugar were diminished. The Lange curve was negative and the Wassermann reaction of his blood and C.-S.F. was negative. There were no abnormal findings in his urine.

His answer to a question was usually a drowsy nod or shake of his head. He had no memory of his journey to the hospital or of having been seen in the out-patient department that afternoon, and said that he had been in the ward for a week. He was a professional footballer, he said, who had been taken to hospital from the football field, where he had injured his knee playing for Margate. As a professional footballer he earned £2 a week. (He is in fact a shop-assistant.) He did not know what hospital he was in, and could not give the date or the day of the week. He believed the month to be October. At simple calculations he was slow and inaccurate.

thalamus. Clinical corroboration had been given by Penfield's case of "diencephalic epilepsy." Experiments on mammals suggested that the pars posterior of the pituitary had no particular function, though the evidence on polyuria was conflicting. The evidence for a hypothalamic-pituitary mechanism was very uncertain.

NERVOUS CONTROL OF THE CIRCULATION.

Prof. SAMSON WRIGHT said that workers in this country had never seemed able to accept the idea that the cervical sympathetic controlled the cerebral vessels, but the early evidence for this had been amply confirmed. Stimulation of the nerve caused marked constriction of pial arteries and a rise of blood pressure in them. The same story could be told of the pulmonary and coronary vessels, except that the vagus constricted and the sympathetic dilated the coronary arteries. The sympathetic was vasoconstrictor to the peripheral vessels, both in skin and in muscle, and sympathectomy would produce dilatation in cases of abnormal vasoconstriction; for instance, in Raynaud's disease. All the arterioles and veins of the body were under vasomotor control to an important degree. The sympathetic was vasoconstrictor to the veins, but vasodilator fibres were also found in the sympathetic fibres and in the posterior nerve-roots. Action currents had been observed in sympathetic fibres; they travelled rather slowly. Both sympathetic and para-sympathetic probably acted by liberating chemical substances peripherally—the former an adrenalin-like substance and the latter an acetyl-choline-like substance.

The carotid sinus—a dilatation at the bifurcation of the common carotid—and the aortic arch contained nerve ends the afferents from which influenced the vasomotor centre, the heart-rate centre, and the adrenalin-producing centre. The endings were extremely sensitive to slight pressure changes and might be called "buffer nerves": they exerted a tonic inhibitory influence on the bulbar circulatory centres and reflexly adjusted heart-rate, arterial tone, and adrenalin secretion to bodily needs. Section of these nerves might cause persistent arterial hypertension, and in rabbits, a marked breakdown of the media. A rise of blood pressure, through the aortic or carotid nerves, would decrease adrenalin secretion, and vice versa. Whenever the pressure tended to alter, these nerves tried to restore it, and they functioned so effectively that extensive damage could be done with practically no change of blood pressure.

THE SYMPATHETIC SYSTEM AND THE ALIMENTARY TRACT.

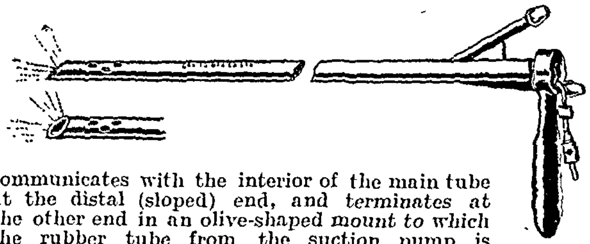
Dr. A. F. HURST described the ileo-gastric and gastro-colic reflexes, saying that in the last few feet of the ileum food collected, and appeared to be actively churned and digested, only passing into the cæcum just after more food entered the stomach. The mass movement of the colon likewise only occurred just after a meal. Many cases of constipation depended on disturbance of these normal sympathetic reflexes. The œsophagus was sensitive to thermal stimuli, but the rest of the canal was sensitive only to distension. All movements depended on increased tension. Very slight tension was the stimulus causing the reflexes; rather more tension caused a feeling of fullness: and more still produced pain. Distension of the pelvic colon produced a sensation of fullness in the lower abdomen, but distension of the rectum produced the call to defæcation. In tabes more than double the normal degree of tension might be required to produce the call, and also the effect was more prolonged. The only known organic disease of the sympathetic nervous system was seen in achalasia of the cardia; the cardiac sphincter failed to relax before the peristaltic waves on account of disease of Auerbach's plexus—either active inflammation with round-celled infiltration, or degeneration. Hirschsprung's disease was an achalasia of the anal sphincter and in a fatal case a similar degeneration of Auerbach's plexus had been found.

PAROXYSMAL SYMPATHETIC OVER-ACTIVITY AND THE OCULO-SYMPATHETIC.

Dr. RUSSELL BRAIN said that sham rage could be produced by a very small incision on the medial aspect of the frontal lobe without removal of any part of the cortex. A considerable variety of attacks comparable with sham rage might occur in man and might be primarily psychical—rage or fear—or primarily physiological—epileptiform. Dr. Brain described illustrative cases. The physiological type—diencephalic epilepsy—was characterised by widespread discharge from hypothalamic centres which had been cut off from higher control. In the psychic types the attack probably started at a higher level than in the physiological types. The nervous mechanism involved played a part in such states as mania, anxiety neurosis, and toxic goitre.

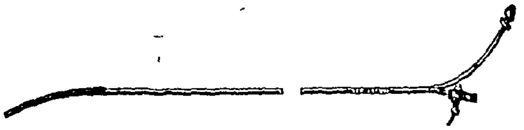
The oculo-sympathetic fibres had a cortical representation in animals, both in the frontal and occipital lobes, and a descending path ran thence to the thalamus and brain-stem and to the upper dorsal segments. The fact that a terrifying sight could cause pupil dilatation presupposed these connexions. True enophthalmos occurred as the result of ocular sympathetic paralysis, which might be caused by brain-stem, thalamic and lateral medullary lesions. Over-activity of this system caused retraction of the eyelids and was often associated with central lesions in the neighbourhood of the posterior commissure. Retraction of the upper lid might be the first symptom of exophthalmic goitre, but exophthalmos could not be produced experimentally by giving thyroid or thyroxin. Dr. Brain described illustrative cases of exophthalmos after encephalitis; and of exophthalmos associated with ophthalmoplegia. Whatever might be the ætiology of exophthalmic goitre, he concluded, exophthalmos, lid retraction, and other symptoms of sympathetic over-activity usually associated with thyroid excess might be produced by organic lesions of the brain, in the absence of thyroid enlargement.

Dr. LANGDON BROWN paid tribute to Gaskell's work on the sympathetic system and said that the most important recent work had been in relating the diencephalon to the autonomic system. He quoted Cushing's description of the small deep-hidden region of the pituitary as the centre of all primitive life, vegetative and emotional, lying between the cortex on the one hand, and the ductless glands on the other. The sympathetic system was arranged to work over large areas of the body at once. The general effects of its stimulation were to prepare the body for a struggle, whereas the general effects of the cranial para-sympathetic were to conserve energy and build up reserves, the sacral portion being expulsive. When one was stimulated the other was inhibited. The rhythm of life depended largely on the fluctuating balance between the two. The two reactions to danger: violent preparation for fight or flight, and complete immobility, permitted of no compromise. We had at present hardly any knowledge of the morbid anatomy of the system, but it certainly of the distal end has however been redesigned to allow forward illumination by means of a special lamp. The bronchoscope consists of a rigid metal tube, the distal end of which is sloped at an angle of 50° and slightly thickened round the edge to prevent trauma. A second much smaller tube is let half-way into the wall of the main tube and carries the lighting attachment. Alongside this small tube and outside the main runs a third channel which communicates with the interior of the main tube at the distal (sloped) end, and terminates at the other end in an olive-shaped mount to which the rubber tube from the suction pump is connected. The lamp is screwed on to a fitting carrying the electric wire connexion in the interior, and a suitable connexion for the cable at the other end. It is held in position in the channel by means of a pin engaging in a transverse hole in the handle of the instrument.

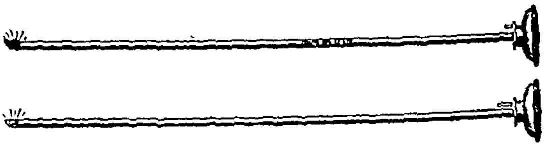


The lamp, specially designed for this instrument, produces both parallel and radial beams of light and the distal (sloped) end of the combined main tube and lamp channel is so arranged as to allow free exit to the light in all directions. A section of a bronchus approximately 3 in. long is therefore evenly illuminated and can be examined either with the naked eye or with the aid of telescopes. Of these three types are used. For ordinary diagnostic purposes the direct-vision telescope is the most useful, structures at 2 in. distance are slightly magnified (× 1·5), those nearer the lens correspondingly more. The second telescope, thinner in diameter and also 3 in. longer, is fitted with a deflecting prism and lamp. It is mainly used for the examination of the lateral bronchi and in conjunction with operating instruments. The third telescope, for retrograde vision, is solely for the inspection of the upper lobe bronchi. These telescopes are anchored to the bronchoscope by a simple pin fitting.

When pus, &c., is found in the main bronchi it is aspirated through the aspirating channel incorporated in the bronchoscope, as mentioned above. A separate suction tube with flexible tip is, however, necessary to aspirate the lateral bronchi and cavities. For some time we had difficulties in emptying constricted bronchi, since it is obviously impossible to aspirate a hermetically sealed cavity. To overcome this trouble we devised a suction tube incorporating a very fine malleable air tube running very near to the end of the flexible portion of the main tube. We found this addition also very useful, apart from its original purpose for washing out a cavity, since the lumen is large enough to allow of the passage of non-viscous fluids such as saline. The procedure is very simple; the stopcock on the main tube is shut, a few cubic centimetres of saline are injected through the fine tube, and immediately the cock is turned the whole is aspirated.



In the construction of these instruments we are much indebted to Mr. R. Schranz, of the Genito-Urinary Mfg. Co., Ltd. (the makers of the instruments), 28A, Devonshire-street, W.1, for the large amount of time he has spent with us in perfecting the instruments and for his mechanical ingenuity and advice without which we should have been much handicapped.



A. J. SCOTT PINCHIN, F.R.C.P.,
London, W. H. V. MORLOCK, M.R.C.P.

MEDICAL SOCIETIES

ROYAL SOCIETY OF MEDICINE.

COMBINED SECTIONS OF NEUROLOGY AND MEDICINE.

AT a joint meeting of these sections held on March 17th the chair was taken by Prof. A. STANLEY BARNES, President of the Section of Neurology. Prof. H. H. WOOLLARD opened a discussion on the

Visceral Functions of the Sympathetic Nervous System.

He said that most of our knowledge of the sympathetic nervous system was due to English workers. One of the most important recent advances had been the introduction of Langley's work into surgery; it had been shown that large parts of the sympathetic nervous system could be removed without apparent hurt. All workers had tried to bring the intrinsic systems of Auerbach and Meissner into relation with the extrinsic systems, but they appeared to be quite independent. The relationship of muscle tonus to the sympathetic system had broken down on anatomical grounds, as the non-medullated fibres concerned had been proved not to be sympathetic; sympathectomy did not abolish tone. Nor did the association of pain with the sympathetic system lie on any solid foundation. Every fasciculus going to a blood-vessel contained medullated as well as non-medullated fibres which might run for some distance with the vessel before rejoining the trunk. The sympathetic system appeared to exert some continuous tonic effects, while others could only be elicited by stimulation. In emergency-conditions it functioned as a whole. It had certain inconstant functions at times, such as the effect on the sweat glands and in the alimentary canal. In fact, the system remained much where it had been left by Langley. The parasympathetic might be looked on as restorative and anabolic, and the sympathetic as making more available the energy of the motor system.

The real interest had shifted from the periphery to the centre, though great difficulty was experienced in unravelling the autonomic centres in the diencephalon, partly because of its inaccessibility and partly on account of the many short neurons which made up the fibre tracts in this region. No function had been found for the pineal gland, but the basal part of the diencephalon contained a number of nuclei having the small-celled structure of sympathetic centres. The subthalamic nucleus was the interesting part in the hypothalamic complex; it seemed to have no relation with cerebrum or cerebellum. Its large cells depended for their integrity on the corpus striatum, but its small cells were regarded as an autonomic centre. The system included part of the thalamus and part of the striatum, and was believed to be associated with various metabolic functions. The importance of the hypothalamus as a sympathetic centre was supported by comparative anatomy, embryology and experimental work, particularly the condition of "sham rage," the anatomical centre of which lay in the posterior half of the hypothalamus and the most caudal and ventral part of the adjacent utilised seven full days after the final defervescence since the serum was richest in antibodies at that time. With a person incubating measles the injection should be made within six days of infection if complete immunisation was desired: during the seventh, eighth, and ninth days from the time of infection inoculation of convalescent serum would only produce attenuation of the attack. One difficulty lay in deciding the exact date of exposure to infection.

The donor should preferably be over 10 years, though Dr. Pierret mentioned that he had sometimes obtained blood in hospital from children as young as 3 years; he should be healthy, free from syphilis, tuberculosis, and malaria; defervescence should be complete; and precautions should be taken as far as possible to avoid taking serum from a patient in the incubation stage of another infectious disease. About 50 to 60 c.cm. could be taken from a child, and 80 to 100 c.cm. from an adult. The serum should be kept in a refrigerator for at least four days before use, to kill any treponemata, and should be subjected to bacteriological culture and the Wassermann test. Properly prepared and kept, the serum remained active for several months. Preference in its use should be given first to infants, next to children under 2 or 3 years of age; in practice, preference was also usually given to hospital cases and to delicate children, to children in families and schools, and to convalescent children. If a case of measles occurred in a hospital ward all the other children should be immunised, and the prevention of an epidemic in these circumstances was the greatest benefit of seroprophylaxis. Young children required a dose of 4 c.cm., children from 3 to 10 years 7 c.cm., and older children 9 to 10 c.cm. Whole blood was only half as active as serum. Failures with seroprophylaxis were few if the technique was adequate. General reactions, with rise of temperature, were occasionally met with, but no cases had been recorded of shock with rigor and collapse.

EXPERIENCE IN THIS COUNTRY.

Dr. **J. A. H. Brincker** said that Bordet's vaccine had been tried in whooping-cough in two L.C.C. hospitals during the past year, but the results obtained were not as favourable as those described by Dr. Pierret. In each hospital the vaccine had been tried in 100 cases, with suitable controls, but no difference had followed its use either in symptoms or incidence of complications. For some years Dr. Nabarro had been using convalescent serum for measles at Great Ormond-street with great success. Recently adult serum, obtained preferably from young men and women who had had measles earlier in life, had been used for the protection of contacts in hospitals, institutions, and residential schools, with valuable results. He was interested to learn that blood had been taken from children as young as 3 years of age. The feeling in this country had been that the young convalescent should not be deprived of blood, and hence the supply of convalescent serum was strictly limited. The injection of whole adult blood had been tried extensively in America, but the tendency in this country had been to concentrate on the use of convalescent and adult serum.

Sir **Almroth Wright** thought that Dr. Pierret assumed too readily that the blood was richest in antibodies directly after the disease. In typhoid the patient scraped through with no balance of antibodies to spare. In whooping-cough, where the organism was known, it should be possible to assess the value of vaccines accurately by scientific methods, not merely by clinical impressions. The vaccine used in this country had certainly been exposed to heat, and he would like to learn a more satisfactory method of preparation.

Dr. **W. Gunn** noted that in France clinicians appeared to get good results with smaller doses of convalescent serum in measles than were in use in this country. He thought that possibly this was related to the indefinite views held by practitioners on effective exposure to the disease; they were inclined to regard all children in the same classroom as contacts when a case of measles appeared, although some of them were not within striking distance of the infection. This point of view would mean, of course, that more children were given the chance of protection than were actually infected, and so would improve the statistics obtained. In seeking the optimum dose of serum for protection of children in his wards, and using controls, he had found a minimum dose of 5 c.cm. of serum to be necessary. In children over 3 years the dose could be decided by multiplying the age of the child by 2 and giving the resultant number of cubic centimetres. He regarded attenuated cases as failures, because the aim was to have no further cases in the ward. He did not consider that blood should be taken from a child of less than 5 years. The results of the use of adult serum in the London County Council hospitals had been fairly satisfactory; a minimum dose of 10 c.cm. was necessary, and, beyond that, double the dosage of convalescent serum had been used. The results had not been quite as good as with convalescent serum; if adult serum was given before the third day the attack was prevented in 99 per cent. of cases; if given after the third day attenuation of the attack was secured, and after the eighth day no effect was obtained. There was reason to hope that it would be possible to concentrate adult serum, so that smaller doses would be effective. After nine to twelve months in storage the serum was known to deteriorate, but it was possible that this difficulty would be overcome by drying.

THE DANGER OF INFECTION WITH TUBERCULOSIS.

Dr. **David Nabarro** said that his experience of the use of convalescent serum agreed with that of Dr. Pierret; the attack had been prevented in 98 per cent. of his cases, but it was not possible to say that all the children treated would have developed measles. He had recently experienced more failures, probably because he had been using serum nine to ten months old. An attenuated attack gave the patient lasting immunity, which was an advantage. Some physicians were opposed to the use of convalescent serum because they thought that in using serum obtained from children there was a danger of inoculating the patient with tuberculosis; tuberculosis was a common sequel to measles and whooping-cough in children. As Dr. Nabarro obtained his serum from adults and filtered it through a Zeiss filter he thought the danger of introducing infection was negligible. On several occasions, however, children had developed considerable reactions, with rise of temperature and malaise. He thought it most desirable to find a method of concentrating serum.

Dr. **J. D. Rolleston** said that the English experience of the value of a vaccine in whooping-cough was less favourable than the French. He thought that whooping-cough might sometimes be spread by the occurrence of unrecognised forms of the disease in adults, as in the case described by Dr. Pierret. Adult serum used in measles sometimes procured attacks so attenuated that it was difficult to say whether the patients had measles or not, and it expressed itself in emotional disturbances. Many psychoneuroses were based on subconscious fear, and a state of continued fear was capable of producing the symptoms of which psychoneurotics complained. *In many diseases of this kind the action of the* sympathetic system showed dissociation or perseveration. Through interaction with the ductless glands, the sugar metabolism might be affected. Evolved in a subconscious plane, the sympathetic remained for ever beyond the control of the will.

Prof. E. D. ADRIAN mentioned the relation of the sympathetic to respiration; the tonic discharge to blood-vessels ran rhythmically in phase with respiration. The sympathetic discharge was not smoothly continuous but very delicately poised. The vasomotor centres had no specific pressor nerves; all the nerves acting on them were inhibiting. They were always being stimulated by the respiratory centre.

SECTION OF EPIDEMIOLOGY.

AT a meeting of this section on March 16th, with Prof. MAJOR GREENWOOD, the President, in the chair, *a discussion* was held on

Biological Prophylaxis and Treatment in Measles and Whooping-cough.

Dr. ROBERT PIERRET, in his opening address, said that physicians and doctors in private practice in France saw more of infectious diseases and had a closer concern with their prevention and treatment than did their colleagues in England, where infectious diseases were linked up with the practice of public hygiene. In consequence there had developed in France a professional outlook upon infectious disease which was more often determined by the teaching of recognised masters than by the evidence of public health records.

In *whooping-cough* there were three aids to diagnosis—namely, the isolation and culture of the Bordet-Gengou cocco-bacillus, the intradermal test, and a combined intradermal and therapeutic test of the value of which he was satisfied. For successful culture the material must be sown directly on to a blood medium. A method more successful than that of making the patient cough into a Petri dish was based on the observation that, at the onset of a spasm, the patient gave two or three coughs with the mouth closed; infected material was therefore expelled in the nasopharynx, and a specimen could be taken from this region by means of a straight swab passed through the nostril in the infant, and by means of a curved swab introduced behind the soft palate in children over 3 years. The intradermal test for whooping-cough consisted of the injection of one drop of the vaccine of Nicolle and Blaizot, in which the organism, killed by fluoride, was present in the concentration of 250 million per 1 c.cm. In addition, Dr. Pierret said, he made a practice of injecting the remainder of the contents of the 1 c.cm. ampoule elsewhere, and had found that this often arrested or reduced the cough, especially if the injection were repeated on the two following days.

The biological agents at the disposal of the medical profession for the prevention of whooping-cough were (1) serum of convalescents, (2) Nicolle's vaccine. The serum of convalescents was little used in France; results were similar to those obtained with measles convalescent serum, the action of the serum being principally abortive but relatively rarely curative. The action was more definite if the serum was given early in the disease. Nicolle's vaccine had been the subject of considerable experiment, and was being used increasingly in France. One injection was insufficient, and it was wiser to give, on alternate days, three injections of 1 c.cm. of fluorised vaccine containing 250 million organisms per 1 c.cm., and *with this method he could claim 90* per cent. of successes in the protection of contacts. It was important that the vaccine should contain numerous strains, and the organisms, if not living, should not in any case be killed by heat, which reduced the therapeutic value of the vaccine. A wider use of vaccinotherapy would, in his view, stifle epidemics and render whooping-cough one of the least important instead of one of the most serious epidemic diseases. Children vaccinated before the development of symptoms or during the catarrhal stage did not acquire a lasting immunity, and might contract whooping-cough a year or two later.

The present position with regard to vaccinotherapy was as follows: (*a*) Negative or partial results were obtained if vaccines were used after the third week of the disease—i.e., after the whoop had been established for more than ten days, and when it was no longer possible to demonstrate the presence of the Bordet-Gengou bacillus. The fixation test had by this time become positive, and the patient had developed all the immunity of which he was capable. (*b*) Results were more satisfactory if vaccinotherapy was used in the second and third weeks of the disease before the whoop became established. Cough was reduced and vomiting might cease after the third or fourth day of the treatment, and occasionally there was complete repression of the disease after two to four days; treatment must be continued or recurrence of the whoop was likely. Children and infants treated by this method remained in good health, and Dr. Pierret had never seen any of the usual complications of whooping-cough in patients treated early. If insufficiently concentrated, wrongly prepared, or given too late, vaccines gave unsatisfactory results. Prophylactic doses recommended varied from one to three injections of 1 c.cm. of a suspension containing from 250 million to 5000 or 6000 million organisms per 1 c.cm., at intervals of two or three days. Dosage should be reduced to one-half or three-quarters for infants. Healthy adults in contact with the case should be vaccinated. In one case the doctor was found to be infecting his patients.

Measles was responsible for a larger total mortality than any other infectious disease. In communities of children and families the secondary cases were the most numerous, and the suppression of these would mean a great economy. Convalescent serum had no therapeutic value, probably because it was insufficiently rich in antibodies. It would be interesting to know whether convalescent serum was richer in antibodies than the serum of a person who, little by little, had been experimentally accustomed to resist the infection. Serum from nurses in a measles ward was more protective than serum obtained from ordinary persons who had had measles long before, and had not since been in close contact with cases. Convalescent serum was not necessarily free from the virus or its toxins, though their potency was *inferior to the antibodies present; it* was conceivable, therefore, that the injection of convalescent serum might involve a danger of infection. Valuable data might be obtained by injecting serum obtained at varying intervals after defervescence. Another objection to convalescent serum was the short duration of the immunity, protection lasting only three or four weeks. There was, moreover, *difficulty* in obtaining a sufficient supply of the serum and in finding voluntary donors. The donor should be with sepsis than the others, but even so the clot was usually formed at some distance from the area of sepsis. In all probability the thrombosis started within 24 hours, while the limbs were stretched, immobile, and flaccid. The valves appeared to form centres of attraction for the formation of clots and the clots often showed valve markings.

One of the most important measures for the prevention of thrombosis was to put the patient in a posture which would not compress and flatten out the femoral veins. Promotion of the circulation by massage was also valuable.

HUNTERIAN SOCIETY.

At a meeting of the Hunterian Society on March 21st, with Dr. DAVID ROSS, the President, in the chair, a discussion on the

Evolution of the Municipal Hospitals

was opened by Dr. W. BRANDER. In one sense, Dr. Brander said, the municipal hospitals had not evolved. They had been created, by a stroke of the pen on April 1st, 1930, when the hospitals previously under the control of the boards of guardians passed into the hands of the municipal authorities. The study of the development of these hospitals alongside the development of the voluntary hospitals afforded an interesting comparison. Since their student days most members of the medical profession had realised that the relation between poverty and disease was reciprocal; poverty begot disease and disease poverty. Medical, social, and economic factors must be considered in deciding the suitability of a patient for admission to hospital. There were three strata of society for which provision must be made: there were those wealthy enough to cater for illness in their own homes or in nursing homes; those who were economically sound until confronted with the additional expense of illness, and for whom the voluntary hospitals catered; and there were those who were never economically sound. Persons in the third group might be accepted at voluntary hospitals, but these hospitals had a discretionary right to pick and choose their cases. With the municipal hospitals the case was different; they were obliged to treat every case sent to them, and were allowed no discretion.

The voluntary hospitals in the early days had begun as voluntary and religious institutions for the shelter of the wayfarer and the sick. The work of the Sisters of Charity, the almshouses, refuges for the insane, and lazar houses had all led up to the foundation of the great voluntary hospitals. St. Bartholomew's Hospital and St. Thomas's were two of the oldest foundations and were originally the catch-alls for the most variegated population. Poverty was the common factor among those admitted to these early institutions, and though they undertook, where possible, the care and cure of the body, their primary concern was the care of the soul. In the fourteenth century the growth of the wool trade, the expansion of pasture land, and the Black Death were all responsible for initiating a considerable migration of the poorer classes from place to place, and it became a duty of the Church to care for them, while delinquency among them was the province of the magistrate; out of this arrangement rose the parish, which was an ecclesiastical, not a civil, unit. In 1601 the first Poor-law Act was passed, in the reign of Elizabeth. Industrial conditions were bad, and the Act remained much the same for the next 200 years. Under it, an overseer, the precursor of the guardian, compelled the collection of rates to maintain the old, the blind, and the helpless. The workhouses were foreshadowed in cottages for the idle who would not, and the impotent who could not work. In these there were intermingled the old and the young, the healthy and the sick, the sane and the insane; sanitary conditions were indescribable, and there was little care of the sick.

In the eighteenth century industrial conditions became still more acute, and landlords complained of the poor-rate. In 1843 a Commission was appointed which was superseded by the Poor-law Board and then by the Local Government Board, and finally by the Ministry of Health. In the early days of the workhouses there was no accommodation for the destitute sick except in the general wards of the workhouse; these had never been intended for the sick, and the public conscience demanded changes which were important in the evolution of the municipal hospitals. In 1868 the Metropolitan Act was passed which admitted of the provision of infirmaries separate from the workhouses. Destitute or sick persons had to be admitted through the relieving officer, and although destitution had never been defined by Act of Parliament, there began to be a relaxation in the accepted meaning of the term: guardians were told that they could judge individual applications on the evidence, and that a person might be regarded as destitute of some form of medical relief though he might not be destitute in other respects.

In a poor-law hospital in the north of England in the old days, Dr. Brander had seen the final stages of all types of chronic disease, every form of tertiary syphilis and of malignant disease too far advanced for treatment. The diseases were the same as those found in any ordinary acute hospital, but the patients were all candidates for the grave. But even before the 1929 Act the work of the poor-law hospitals had begun to encroach on that of the voluntary hospitals, though without intention or design on the part of the guardians. The primary cause was an urgent social need. At the time of the enforcement of the Act the London County Council took over 18,000 beds for acute cases, 10,000 for chronic sick cases, 15,000 beds from the Metropolitan Asylums Board, and 35,000 mental hospital beds. The standard of work in some of the hospitals transferred was equal to that found in the large voluntary hospitals.

MEDICAL EXPERIENCE IN THE MUNICIPAL HOSPITALS.

Dr. PHILIP HAMILL said that he had a great admiration for the work of the municipal hospitals. They were faced with all the cases that the voluntary hospitals rejected. It was at the municipal hospital that the later breakdowns in the course of chronic disease could be seen, and he always advised newly qualified men to take an appointment in a municipal hospital after finishing their house appointments in their own hospital. He considered that the builders of the municipal hospitals had shown great forethought when they placed the buildings in the outlying zones of London. He held no brief for rebuilding voluntary hospitals in the inner zone. There was an opportunity in the municipal service for improving the training of nurses: they could, for example, spend part of their general training at fever hospitals.

Dr. NATHAN RAW described the position in a large Liverpool infirmary 35 years ago. He had been superintendent, with four resident medical was even safe to leave them in a scarlet fever or whooping-cough ward.

Captain S. R. DOUGLAS said that there was no particular reason why measles should resemble typhoid in antibody formation. Following an attack of yellow fever the patient had a high degree of serum protection, and this usually lasted for life. It had been found, by experiments on distemper in dogs, that convalescent serum would give protection against a considerable amount of virus. If a large dose was given after the onset of symptoms, the temperature fell and the dog developed solid immunity; a concentrated dose given later had the same effect. The difficulty of obtaining concentrated measles serum lay in the limited supply of blood. The ideal would be to find an animal which took measles, when sufficient serum could be obtained to treat all cases.

Sir GEORGE BUCHANAN mentioned the occasional outbreaks of a type of diphtheria which was not counteracted by full doses of antitoxin. Though the notifications of diphtheria were rising the death-rate was fairly constant, and had not so far been influenced by these cases of diphtheria gravis. Dr. Pierret had suggested that Bordet's vaccine should be given in whooping-cough before the development of the whoop; how was the diagnosis to be made at this early stage?

Dr. E. W. GOODALL added that in some cases the first symptom was the whoop; how could an earlier stage then be diagnosed? He had performed autopsies on 22 children who died following whooping-cough, and in seven of these death had been due to acute miliary or acute pulmonary tuberculosis. Among autopsies on 130 measles cases tuberculosis was found in seven. He thought, therefore, that whooping-cough was more likely to be followed by tuberculosis than measles.

HARVEIAN SOCIETY.

AT a meeting of this society held at Paddington Town Hall on March 17th, the chair being taken by Mr. C. P. G. WAKELEY, the President, Sir BERNARD SPILSBURY delivered the Harveian Oration on

Pulmonary Embolism.

In some of the cases he had seen, he said, the clots had been so long that they projected beyond the pulmonary artery, into the right ventricle, death being due quite as much to interference with the function of the valve as to blockage of the artery. He proposed to draw material for his observations from 120 cases of pulmonary embolism on which he had performed autopsies, and he would show that this condition was responsible for a fair number of sudden deaths in apparently healthy persons. The main factor in the production of the thrombi causing pulmonary embolism was alteration in the flow of blood in the veins. This might arise as a result of enfeeblement in the general circulation, of diminished suction action of the chest, decrease or absence of muscular contractions in the limbs, local interference—pressure on veins—or disease of the vessel walls and varicosity. In a very large proportion of his cases sepsis had not been a factor, and even when sepsis had been present the thrombosis had been at some distance from it. He had never yet examined a pulmonary embolism which he could describe as a septic embolus. A factor in venous thrombosis which was most difficult to assess was altered coagulability of the blood; some cases of thrombosis and embolism were undoubtedly partly due to this. Coagulability was raised by hæmorrhage, crushing of tissues, and some forms of sepsis. In only one case of his series, however, could altered coagulability be regarded as the sole cause.

In a very large proportion of cases the embolus arose from a thrombus in the femoral or iliac veins; in about 90 per cent. the thrombus was in the lower limb or pelvis. Emboli did not conform to the shape of the vessel in which they lay and were generally small; the size of the little finger or of a pencil. Their length varied from 2 in. to 9 in.; their diameter varied in different parts, and they had irregular branches which did not conform with those of the vessel in which they lay. They were heaped up in that vessel, often packed so tightly that they were only dislodged with difficulty, but they were not adherent unless there had been more than one attack before death; they were sometimes solid and sometimes cylindrical or ribbon-like. The older they were, the firmer, but they were always firmer than any post-mortem clot. Usually the surface was light-coloured with a very fine mottling. Besides the fatal embolus, others might be found in the heart or in one of the main veins, and infarcts might be seen in the lungs.

Death might be due to sudden strain on the right heart or to the rapid fall of blood pressure in the lesser circulation. Even when death had occurred under anæsthesia, while the patient was being closely watched, there seemed to be variations in the symptoms; these probably depended on the size of the embolus. In some cases the right heart was paralysed and in others, with a rather smaller embolus, the diminished flow of blood through the lungs brought about respiratory distress.

ELEVEN GROUPS OF CASES.

The 120 cases in his series could be grouped according to the conditions in which embolism might occur: (1) ambulatory—chiefly old people with flabby dilated hearts and poor circulation; often the thrombosis started in varicose veins and spread up the thigh. (2) After very slight accidents in feeble old persons. (3) In serious cardiac lesions in young people. (4) In complete paralysis; one man had died of pulmonary embolism only three days after a grave injury which had rendered him paraplegic probably because of the absence of muscular movements to promote circulation. Immobilisation of a part might have the same effect. (5) After pressure on the veins—e.g., from a hæmorrhage, abscess, or tumour. (6) In cirrhosis of the liver slowing the hepatic circulation. (7) In cases of varicose veins (8) After the injection treatment of varicose veins there were only three examples of this in his series so the complication was rare. In two cases sodium salicylate and in one sodium morrhuate had been used. No evidence of local sepsis could be found (9) In puerperal conditions—death usually occurring from the seventh to the twelfth day after labour without any signs of sepsis. In one or two of the ten cases involution had seemed to be retarded. Sir Bernard had only one record of pulmonary embolism from over 300 cases of abortion, many of them septic. Pulmonary embolism had occurred during healthy pregnancy—usually about the seventh month, presumably as a result of pressure on the pelvic veins. (10) Under anæsthesia. In many of these cases the embolism appeared to bear no relation to the operative procedure, but in others manipulation had undoubtedly dislodged a thrombus. (11) After operation; this group was more closely associated

REVIEWS AND NOTICES OF BOOKS

Diagnosis of Joint Disease.

By NATHANIEL ALLISON, M.D., F.A.C.S., Professor of Orthopædic Surgery, University of Chicago; and RALPH K. GHORMLEY, M.D., F.A.C.S., Assistant Professor of Orthopædic Surgery, Mayo Foundation. London: Humphrey Milford, Oxford University Press. 1932. Pp. 207. With 50 illustrations and 9 plates (6 in colour). 52s. 6*d*.

THE authors were inspired to write this book from the conviction that the diagnosis and classification of joint diseases, as it stands to-day, is inaccurate. Such observations as those made by Ghormley, that out of 41 positive diagnoses, only 66 per cent. proved to be correct, and, conversely, that out of 42 cases dismissed as non-tuberculous, 55 per cent. eventually turned out to be tuberculous, shows that all is not well with our present methods. Apart from certain histological findings in rheumatoid arthritis, upon which they lay greater emphasis than other workers, the authors do not claim to have made any discoveries; but they insist that only by investigating every case scientifically and evolving some comprehensive yet simple mode of classification can any progress be made in this most difficult subject. To this end they have collected 289 cases of joint disease during the last six years and have attempted in each case to find the answer to the questions: What is the ætiological factor? Which tissue of the joint is primarily affected? What is the nature of the change in the joint tissues? After marshalling all the facts, they come to the conclusion that in cases where the causative agent is known the type of arthritis should be registered under that head, but in cases where the cause could not be discerned, the best term for classification is that which accurately describes the characteristic primary changes within the joint. These changes could usually be grouped under two headings, proliferative and degenerative. They think that no useful purpose can be served by multiplying names to describe the same pathological process. Such conditions as we in this country variously call rheumatoid arthritis or atrophic arthritis, they prefer to place under the heading of proliferative arthritis of unknown origin, because, according to them, the primary change is a proliferative one, affecting the synovial membrane and the bone subjacent to the articular cartilage, and the atrophy, though a characteristic feature in the X ray plates, is really only a secondary change due to disuse. Similarly, what we call arthritis deformans, osteo-arthritis, or hypertrophic arthritis, they term degenerative arthritis of unknown origin, because they hold the primary change to be a degeneration of the matrix of the articular cartilage and such hypertrophic activities as exist to be secondary to the changes in the cartilage. Again, in discussing pyogenic infections, they would like to discard such variations as serous, seropurulent, and purulent, because these merely represent phases in the normal evolution of a suppurative arthritis, whatever the responsible organsim may be.

After a preliminary survey of physiological considerations, the authors proceed to discuss each group separately and at the end of each section append numerous case-histories with excellent X ray pictures and microphotographs. They quote the authority for every statement made, with the result that an extremely useful bibliography is provided and a wealth of information is compressed into a short space. No pains have been spared in the preparation of this work, and it leaves the impression of care, usefulness, and sincerity. Students, qualified or unqualified, wishing to interest themselves in this subject would find it an invaluable starting point to their researches.

Atlas du Cancer.

Neuvième et dixième fascicules. Les tumeurs des centres nerveux et des nerfs périphériques. By GUSTAVE ROUSSY and CHARLES OBERLING. Paris: Libraire Félix Alcan. 1931. Fr.80.

AN atlas in pathology may perform two useful services. The first is to provide a convenient work of reference for those engaged in diagnosis. The atlas compiled by P. Bailey and published in the Archives of Pathology and Laboratory Medicine (1927) is an example of a useful paper for this purpose. The other function of an atlas is the enlightenment of research workers in the same field, who may be greatly assisted by frank statement of convictions and difficulties. The specialist who lays his cards on the table in this manner confers a favour on his fellow workers, and this is particularly true when the ground covered is difficult and controversial, such as the classification of the gliomas. In this atlas text and illustrations are well balanced. The text is succinct and adequately descriptive; it embodies a good deal of speculation on controversial topics. The illustrations, which are mostly reproductions of water-colours, are admirably clear and instructive. The classification adopted is evidently based on that of Bailey and Harvey Cushing, but the object here is the representation of common types rather than an examination of their histogenesis or the inter-relationships between the different types. The types are correlated with those of other authors by lists of synonyms.

Much controversial matter is presented. In the drawings of the normal neuroglial elements that serve as an introductory plate, there is little appreciation of the finer structure of the oligodendroglial cell, and the student would find it difficult to distinguish it, in practice, from a small astrocyte. It is peculiar, too, that the method quoted for the demonstration of these oligodendroglial cells is a modification of a method that is selective for astrocytes—namely, Cajal's gold chloride sublimate method, rather than Hortega's specific silver carbonate method for oligodendroglia. This may possibly explain why the authors have encountered the unusually large proportion of 16 oligodendrogliomas in 251 cerebral tumours. Moreover their "oligodendrocytome à cellules fusiformes" is admittedly the type called by Bailey "spongioblastoma uni et bipolare." The cells of this tumour do not stain in the same manner as oligodendroglia, and hence the tumour would not be acceptable to most workers as an oligodendroglioma of any kind. Undoubtedly in this grouping the authors have been swayed by the theory that underlies their designation of the nerve-root tumours as peripheral gliomas. This theory is based upon two assumptions: the first is that the neuromas are tumours of the sheath of Schwann cell, the second that the sheath of Schwann cell is of ectodermal origin and therefore perhaps homologous with the oligodendroglial cell. Neither of these hypotheses is officers. Autonomy was demanded by the Local Government Board, and he and his staff had to perform every operation required. After 17 years he had performed 8000 major operations. Eventually extra assistance was grudgingly granted, and now the hospital had a full consultant and laboratory staff. In his opinion, the National Health Insurance Act should have its own hospitals, and he thought that in future the municipal hospitals would probably be transferred to the service of this Act. The system worked well in Germany.

Dr. W. H. F. OXLEY gave the point of view of a general practitioner in the east end of London. Until April, 1930, at the local hospital three medical officers had been in charge of 300 beds, and had been so severely overworked that he had avoided sending patients into the hospital. During the past two years, however, he had had the chance to realise the opportunities of a properly staffed municipal hospital, and he thought it possible that in the future these would be the leading hospitals of the country, centres of medical education with a personnel of professorial rank like the Scandinavian State hospitals. He thought that some liaison should be made between the voluntary and municipal hospitals to improve the obstetric teaching of medical students. The obstetric material at the disposal of the voluntary hospitals was quite inadequate. He suggested that it should also be possible to secure an interest for the general practitioner in hospital work, perhaps by offering him an appointment as clinical assistant.

THE WORK OF MEDICAL SUPERINTENDENTS.

Dr. J. B. COOK mentioned some of the reforms achieved by the medical superintendents of municipal hospitals. In 1899 night nurses used to be appointed permanently in these hospitals, but thanks to the efforts of the Society of Medical Superintendents this had been remedied, and the system of alternation now in action had been accepted. It was also thanks to the work of the Society in 1898 that cases of pulmonary tuberculosis were segregated, and not placed in the acute wards. He thought some general system of insurance should be instituted so that patients could pay something to the hospital during their stay in the wards. He agreed that it should be possible to augment the obstetric experience of medical students in the municipal hospitals, and though this might be at the expense of the midwife, it was preferable that the doctor, rather than the midwife, should see difficult cases. General practitioners unfortunately found it extremely difficult to keep appointments to time, and it was essential that hospital routine should follow a time-table.

Sir BRUCE BRUCE-PORTER thought that in future the work of the general practitioner would be purely preventive, and that all patients ill enough to go to bed would be sent into hospital.

Dr. W. E. A. WORLEY found that some patients who could afford the fees of a maternity home were going into the Hackney Hospital because they knew they would get excellent attention there at much lower rates. He thought that it would help the general practitioner if he were always informed of the treatment given to his patients while in a municipal hospital; at present this was not always done.

Dr. BAILEY said that he believed that separate infirmaries were created by an order of the Local Government Board under the Poor-law Act of 1832, and not as a result of the Metropolitan Act. He quoted the definition of destitution given to the Royal Commission in 1908 by their legal adviser, from which it appeared that anyone might claim to be destitute.

Dr. J. F. HALLS DALLY asked what the future policy of the L.C.C. was likely to be. He thought that the municipal maternity hospitals might be used for post-graduate teaching as well as for the training of students. He would like to see more beds set aside for the treatment of rheumatic children.

Sir THOMAS CAREY EVANS thought the voluntary hospitals suffered through being governed by lay bodies. Their funds were in consequence not economically spent.

Dr. D. A. COLES asked what would be done in the municipal hospitals to arrange for consultations with general practitioners about the cases they sent up.

Mr. HOPE CARLTON saw no reason why a doctor should cease to practise privately because he had entered the service of a municipal hospital; in the legal profession a man was able to practise even when appointed to some official post, such as that of recorder.

A vote of thanks to the speaker was proposed by Mr. MORTIMER WOOLF and seconded by Dr. JAMES I. P. WILSON, and Dr. BRANDER replied.

NON-INFECTIVE NEPHRITIS.—Referring to our report (p. 620) of his opening remarks on this subject at the Medical Society of London, Dr. A. Arnold Osman writes: "I did not say that in examining 2000 histological sections of kidneys from consecutive post mortems that 95 per cent. had chronic nephritis of a primary type, or even of any kind. I merely mentioned that, though not an histologist, I had, as a result of this examination, reached the conclusion that the figures of Herringham and others which I quoted on the incidence of chronic nephritis in cerebral hæmorrhage, heart disease, &c., and which I believed were based chiefly on the macroscopic appearances of the kidney, were substantially correct."

CHILDREN'S HOSPITALS.—Last year 2896 children were admitted to the general wards of Birmingham Children's Hospital and to the day ward 4042; new medical out-patients, 5728; new surgical out-patients, 9416. The average length of stay was 25 days, an increase of a fraction over a day. Research work carried out in the biochemical department during the year, the report says, has been concerned largely with the anæmias of infancy and childhood and with the possible connexion between nutritional anæmia of early childhood and prenatal feeding.—The Legislative Council and the House of Keys of the Isle of Man have passed the Education (Extension of Medical Treatment) Bill. The measure extends the provisions of the Education Act as to medical and dental inspection and treatment to children under school age, and enables the Education Authority to provide orthopædic treatment for young persons up to 21 years of age. It is estimated that the continuance of an annual grant of £500 for two years will enable all the urgent and the majority of the less urgent cases in the island to be dealt with.—The annual report of the Royal Hospital for Sick Children, Glasgow, urges the provision of a completely equipped orthopædic department which would form the centre of an organisation for Glasgow and mid and West Scotland. It is also desired to establish a research endowment fund whereby the entire resources of the hospital could be utilised for consistent and sustained inquiry into the diseases of infancy and early childhood. Last year the hospital treated in the wards 5856 patients, and there were over 22,000 attendances of out-patients.—The Dowager Duchess of Beaufort has opened the new wards in the reconstructed portion of the Bristol Royal Hospital for Sick Children. Although various wards were closed last year during building operations, over 1000 children were treated in the wards and there were nearly 5000 out-patients, over 1000 of them being women.

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Rheumatism, Lumbago,
Sciatica, Neuritis, Gout, etc.
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" I prefer to regard sciatica as a neuritis and not merely a neuralgia, and I further believe that the commonest cause of neuritis is uric acid. At all events **my most rapid and lasting results in its treatment have been obtained by that excellent preparation Agotan.** I have had marked success with it."

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M.D., C.M., D.P.H., etc.

" I have run through the whole gamut of B.P. remedies, and I have tried, I think, all the proprietary uric acid solvents of the present day, but after many years of experience **I have come to rely on Agotan as the most trustworthy preparation at present available.** The conditions in which it may be prescribed with confidence embrace all forms of subacute rheumatism, muscular rheumatism or myalgia, including sciatica, brachial neuritis, and gout, whether acute or chronic, and most of the gouty skin diseases. The last group often yields remarkably well to Agotan."

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well supported by observation, although the second enjoys a good deal of popularity in some quarters at the present time. Most pathologists, for the present at any rate, will prefer the theory that the neuromas are fibroblastic tumours, since this is in accordance with the evidence of differential staining.

Another distinctive point of view is found in the authors' designation of the cerebellar medulloblastoma as "neurospongiome." This nomenclature is based upon original work, as a result of which the authors claim that a large proportion of the cells in these tumours possess the staining reactions of neuroblastic cells. They resemble the small granular cells of the cerebellar cortex. This work is of considerable importance and, if confirmed, will greatly advance our knowledge of these tumours.

The interest of this atlas to the specialist is obvious. Those who are more concerned with the recognition of types of glioma in the course of routine work will also find it valuable; the authors show that much may be achieved in such recognition by the use of routine staining methods. They do not, however, belittle the importance of using a variety of different methods if a satisfactory analysis of the cytology of these tumours is to be obtained.

An Introduction to Tropical Pathology.

By T. BHASKARA MENON, M.D., M.R.C.P., Acting Professor of Pathology, Medical College Vizagapatam. With a Foreword by Major-General C. A. SPRAWSON, C.I.E., V.H.S., M.D., F.R.C.P., LL.D., I.M.S. Calcutta: Thacker's Press and Directories, Ltd. 1931. Pp. 210. Rs.10.

THIS small book, according to the preface, is intended mostly for undergraduate students in the tropics. It has but few pages, the type is large, and since many illustrations are included there is not much solid substance in the fare provided for the reader.

The author's opinions with regard to the infective stages of *E. histolytica* mentioned on p. 65 will not meet with general acceptance and the description of the pathology of blackwater fever might be considerably expanded. To bring the chapter on sprue up to date much more would have to be said about the types of anæmia and bone-marrow changes than the author has found room for. There is indeed little pathology in this book which is not dealt with at least as fully in the standard text-books on tropical medicine, and the absence of a fuller description of symptomatology in relation to pathology tends to make even this short book difficult to read. The illustrations are clear and the microphotographs are well reproduced.

Text-book of Gynæcology.

By SIDNEY FORSDIKE, M.D., F.R.C.S. London: William Heinemann, Ltd. 1932. Pp. 290. 15s.

THIS small book is intended for the use of students and practitioners. It is clearly and concisely written, the print is good, and the illustrations are exceptionally well produced for a text-book of this size. The views expressed are thoroughly conservative and will be generally accepted; the general arrangement of the material calls for no comment. On the other hand it is doubtful if students will obtain all the information they require for their final examinations from a book of this scope. Moreover, the compact style makes the assimilation of the subject matter a laborious process and demands much concentration. The popular standard works for the student of to-day are either comprehensive text-books or synopses, and there is much to be said for this grouping. This book is neither one nor the other. Mr. Forsdike's contribution might be of service to students who are starting their gynæcological appointments, for it will enable them to get a general survey of the subject with reasonable ease; he might with advantage develop a more ambitious volume on the same plan, for the subject is admirably presented and the general style is far above that of most books of this size. A few minor criticisms might be made. It is not customary to classify follicular and lutein cysts of the ovary under the heading of benign cystomata, and the material in the chapter on embryonic tumours requires rearrangement. The chapters on radium treatment, post-operative treatment, and gynæcological therapeutics are particularly good.

Practical Morbid Histology.

A Handbook for the Use of Students and Practitioners. Second edition. By ROBERT DONALDSON, M.A., M.D., Ch.B. Edin., F.R.C.S.E., D.P.H., Sir William Dunn Professor of Pathology in the University of London; Hon. Pathologist, Guy's Hospital. London: William Heinemann, Ltd. 1931. Pp. 487. 42s.

THE author has greatly improved this work by introducing illustrations into the second edition; the first was not illustrated and was therefore not likely to appeal strongly to students. This new edition, with over 200 beautifully reproduced drawings, should prove much more attractive in spite of its increased price. In the subject matter a number of additions and alterations have been made. The author's original intention was to confine the work to descriptions of histological appearances, thus providing a guide to the study of morbid histological sections; but the scope of the work has now been extended. Concise accounts of the pathology and of the morbid anatomy of the lesions are included as well as descriptions of their histology. A short section on parasitology and also a 40-page section on histological technique and stains have been added. The work is now a fairly comprehensive text-book of practical and special pathology; the subject is treated in a sound and orthodox manner, the writing is clear, and the essential points are well represented. The illustrations, all but two of which were drawn by the late Mr. Richard Muir, of Edinburgh, are mostly excellent; they possess that degree of the diagrammatic which gives the most effective interpretation of histological structure to the beginner. An unfortunate feature of the book is that these illustrations are not used to the best advantage. The author's opinion that illustrations are not really necessary in a book of this kind is recorded in the preface, and he has allowed this view to interfere with the proper development of the work; for, although he has inserted the illustrations, he has made no attempt to correlate his text with them. No reference is made to them, nor are they directly used to illustrate particular points discussed in the text. On pages 12 and 13 for example, the note on the plasma cell which describes its structure and appearance in some detail, gives no reference to the picture of a plasma cell on page 2. As a result of this incoördination many opportunities of simplifying the teaching of the subject are missed, and the whole book shows a lack of cohesion between component parts. Apart from this the teaching is sound.

THE LANCET.

LONDON: SATURDAY, MARCH 26, 1932.

THE PROBLEM OF CONVALESCENCE.

ILLNESS which neither terminates in death, nor drags on indefinitely without prospect of recovery, must pass through a stage of convalescence. It is during this stage, as ELIA inimitably showed, that the mutual bond between doctor and patient is apt to weaken, and as a consequence, the cure is often imperfect or needlessly delayed. The doctor, on his part, has labelled the case with a diagnosis, has finished all the urgent and most interesting part of the treatment, and knows that the patient is out of danger and should get better. Other acute cases, with their pressing calls on his time and thought, drive its memory from his mind, or he may feel diffident in urging further attendance and consequent expense to the patient, or on the other hand feel it unjustifiable to retain him in the occupation of a hospital bed. The patient, on his part, is reluctant to trouble, or to pay, the doctor more than is absolutely necessary and feels he must get back to work. This attitude may result in too early a return, an imperfect cure and possible relapse, or a long period of indifferent health. Among insured patients the opposite may happen. A middle-aged labourer, with wife and family, brings down a hernia at his work. He is put on the waiting-list of the local hospital and spends some weeks in idleness and anxiety about the operation he has been told he requires. In due course he is admitted, all goes well and he is discharged in three weeks with the injunction to take things easy for a time. He spends more weeks in idleness, reporting to his panel doctor for certificates at intervals, and inspecting his well-healed scar with profound distrust. Before long he is badly out of training, and has lost confidence in himself and broken his once well-established habit of regular occupation. When, and how, shall he return to work? To advise light work is useless: it is not to be had: with the labour exchanges crowded with able-bodied men, who will give him employment? So, with his family dependent on him, he clings to the slender income of sick benefit, rather than launch out into the stormy waters of the labour market, and another case under the Workmen's Compensation Act is added to the list at the county court. The man is neither a malingerer, nor the victim of traumatic neurasthenia, though he may be described as such by the opposing lawyers. he is suffering from the lack of a properly regulated convalescence.

In most districts the present hospital accommodation is adequate for the treatment of acute cases, but many patients are retained for a time, in the general wards, after they have ceased to require active hospital treatment, because they clearly are not fit to return home. And there is no alternative. The rate of turnover of the hospital beds is retarded and a long waiting-list accumulates. The usual solution suggested for this problem is the building of fresh hospitals and the enlargement of the old ones. But such a procedure is uneconomical while it does nothing to reduce the numbers of half-cured and semi-chronic invalids. The right solution would be to set up in connexion with every large centre an establishment specially designed, staffed, and equipped for the treatment of convalescent cases. In this country there are very few such establishments, although, for instance, the Astley Ainslie Institution attached to Edinburgh Royal Infirmary is a happy exception and an inspiring example. Many of the larger hospitals have annexes, on the outskirts of the towns they serve, which to a point supply the deficiency; but they can take only a small proportion of hospital patients and, unless large, they cannot work with economy or efficiency. What then are the requirements which an ideal institution should possess? First, no acute cases must be admitted, nor any case suffering from an incurable condition. The centre is not equipped to deal with the former and the latter will tend to dispel the atmosphere of optimism and steady progress to full recovery which is one of a good home's most powerful therapeutic assets. Secondly, it should be subdivided into sections to deal separately with various special conditions—cardiac, post-operative, orthopædic, nervous, and so forth; for each will want, to some extent, specialised treatment. Thirdly, it should be large enough to ensure that no case need be discharged before it has obtained the maximum of benefit obtainable. Lastly, it must possess ample facilities for providing, and enforcing, graduated recreation and work, both mental and physical. The last factor is, perhaps, the most important and difficult of all. It entails the organisation of games and physical exercise, garden work, farm work, and a variety of indoor trades and occupations, and the permeation of a tradition of discipline and morale so that all the inmates carry out conscientiously the tasks set them. Such an ideal is by no means unattainable. It is seen in a number of the best sanatoriums for tuberculosis, and on an even larger scale in such colonies as Enham and Papworth.

Finance is the rock on which such schemes founder and the present time of depression does not seem an auspicious one for the launching of such ideas. But there are certain aspects on the financial side which merit consideration. It should not be difficult to find buildings and estates which, with comparatively little adaptation could be made ideal. Throughout the country there are large houses, with grounds and farms attached, for sale at grotesquely low prices. The cost of maintenance will naturally be very much less than that in a general hospital, for fewer and less highly trained nurses will be needed, and the overhead charges and cost of equipment will be low. If properly organised, the institution should be able to keep itself in garden and dairy produce, do its own laundry and cleaning by the work of the patients, with the minimum of paid supervisory officials. Some

Reminders and Suggestions

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A combination of Guaiacol, Calcium and Phosphoric Acid pleasantly flavoured with Syrup of Orange Flower & Cherry Laurel.

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LITERATURE AND SAMPLES ON REQUEST FROM

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corpuscles which are available. It may well be, as he suggests, that this substance has a general influence on the metabolism of iron which is a necessary constituent of every cell in the body, and it is a striking and significant clinical fact that the first effect of giving liver to an untreated case of pernicious anæmia may be a great improvement in his sense of well-being two or three days before there is any perceptible change in his blood: he sits up in bed and asks for the newspaper and a cigarette without any alteration in his percentage of hæmoglobin or his reticulocytes, and it is difficult to believe that his general symptoms are due solely to anoxæmia. The connecting link between these two extremes is found in the anæmia with a low colour-index which occurs almost exclusively in married women, is much aggravated by pregnancy, and can be cured with massive doses of iron but not with liver. It has no satisfactory name; "microcytic anæmia" and "simple achlorhydric anæmia" both have the general disadvantages of all definitive names, and other anæmias have small cells, while about a fifth of the examples of this disease have not got achlorhydria. Considering that Dr. WITTS has been chiefly responsible for the recognition and study of the condition in this country, "Witts's anæmia" would be a convenient label until we know enough to fit the condition into some completely rational scheme. He has made too the fine discovery that the gastric juice contains the ferment which will generate from beef the substance which is missing in pernicious anæmia, though it has as little acid or pepsin as in Addisonian anæmia. Hence the megaloblasts can mature to normoblasts and the patient can be cured with ample supplies of the iron which is needed for the transformation of normoblasts to red cells.

These very substantial advances in knowledge have been due in the main to the intelligent use of two technical procedures—fractional test-meals and the precise measurement of the sizes of red cells inaugurated by Dr. PRICE-JONES. In minor degrees the exact enumeration of reticulocytes is a distinct improvement over the rather vague determination of polychromasia, and Dr. PIJPER's diffraction method has been very useful in giving an easy, if rather rough, method for ascertaining cell sizes. The study of red cell diameters has given us criteria for the identification of the different anæmias much more definite than we had before; the stomach-tube is mostly responsible for our new knowledge of the causation of those which depend on misfunctioning of the bone-marrow. Normal gastric juice contains acid, pepsin, rennin, and the hæmatinic ferment, and the products of its action are absorbed from the intestine. It may fail in various ways, most commonly in middle life. If it fails completely, we have megaloblastic Addisonian anæmia, and we get the same result if, as sometimes happens, the hæmatinic ferment fails while acid and pepsin continue or if bad intestinal absorption frustrates adequate gastric digestion. If it fails in everything but the hæmatinic ferment, we are likely to get Witts' anæmia owing to defective absorption of iron. The interplay of these considerations makes it easier to understand why a case of simple microcytic anæmia may develop into megalocytic pernicious anæmia and, occasionally, vice versa, and why some people with achlorhydria are quite well.

Finally, we would draw particular attention to the group of hæmolytic anæmias described in the third lecture. We have here pretty plainly an uncommon disease which needs much further study—so uncommon that combined effort is needed for its elucidation. Some examples have the characters of a subacute infection, and if the patient survives there is no prospect of a recurrence: the marrow is active and responds as it normally does to loss of blood. Rare and obscure diseases are apt to be put on one side until someone has provided some sort of background on which they may be looked at: we hope that Dr. WITTS has done this and roused an interest in a condition about which we want to know more.

THE STORY OF THE TUBERCLE BACILLUS.

FIFTY years ago last Thursday ROBERT KOCH showed the Physiological Society of Berlin the organism of tubercle which had until then eluded search. Others before him, especially COHNHEIM, had insisted that tuberculosis was a chronic infectious disease due to a specific organism, and the closely related lepra bacillus had already been discovered. Systematic botanists of the time, like v. NAEGELI, mocked at the part attributed to microscopic vegetable life in the causation of disease, regarding it as akin to the personification of the elements by primitive peoples. KOCH however brought the bacilli within range of his microscope lens by means of prolonged staining in alkaline methylene-blue and counterstaining with vesuvin which discharged the blue colour from all the tissue elements except the tubercle bacilli. He saw the blue rods first on a coverslip preparation of miliary tubercle accidentally left in contact with methylene-blue for 24 hours in an ammonia-laden atmosphere. He found that this peculiarity of being rendered visible by the combined action of methylene-blue and vesuvin was possessed only by the bacilli of tubercle and of lepra. Commonplace though that may now sound, this first essay in bringing out by staining methods differences between organisms otherwise so similar was, as our leader writer hazarded at the time, the inauguration of a new era in our knowledge of the ætiology of diseases and in the organisation of measures for their prevention.

ROBERT KOCH.

Now if KOCH had done this and no more than this, March 24th, 1882, would still be an important date. But, statesman that he was, he did not publish his discovery until he had found these blue-fast bacilli not only in recent miliary tubercles money no doubt will be required, and it should come, in large part, from health insurance companies and societies. At the present time the greater number of these make no direct contribution to the hospitals for the treatment of their members, relying on the ratepayer and private charity to supply this most costly service for them. They would in any case save much in sickness payments, for patients would recover more quickly and completely their full working capacity, the number of cases of so-called traumatic neurasthenia would decrease; county court actions would become fewer, for no patient could, and few would, wish to maintain they were unfit after a period of full work at the convalescent institution. A further contribution should come from local borough and county councils. Such an investment should yield a quicker return in good health than much of the money now spent, for instance, on tuberculosis; while the greater rate of turnover at the general hospitals would save the expense of adding to their existing number of beds. Finally, the patients themselves should pay something, however small; for it is human nature to undervalue benefits which come for nothing, and a small payment would be an incentive to take their treatment seriously.

Some may doubt perhaps how amicably municipalities and health insurance companies would work in double harness. Should they prove an awkward team, other methods of raising money might have to be devised. However established it would, we believe, soon appear that large convalescent centres are in the main an economical addition to the health services by completing the fine work now being done in the general hospitals.

ANÆMIA.

LECTURES seem to be coming into their own again. They were at one time occasions of moment; scholars and students were few and scattered with small opportunities of conversational intercourse; the printed word was occasional and copies scarce, so that lectures and discourses were the means by which learned men passed on their erudition to those who were curious enough to want to know. Their importance may be taken to have steadily declined during the nineteenth century, certainly in its second half. Their enormous increase along with the great extension of university teaching led perhaps inevitably to a decline in their quality, and it was often more pleasant and at least as profitable to get the information from the abundance of printed matter which had become available. But in the present century, and in the medical sciences especially in the last ten years, this print has become unmanageable and serious students may not know even where to look for the information they want, and hardly anyone who is personally involved in working in some small corner of his own has the chance as well as the inclination to know what is going on elsewhere. Lectures are therefore coming in again either to give an expert's views on some special topic or to suggest generalisations derived from varied fields, and if we may judge from the audiences which have lately gathered at the College of Physicians and elsewhere it certainly seems that London students, young and old, are coming to value good lectures more than they did a few years ago. We say good deliberately, for lectures now are not readings. The lecturer must needs have a tale to tell, but how he tells it matters quite as much as what he has to say. Whatever his particular technique, personality and sincerity are as desirable as orderly clarity. A good lecture seems indeed to have much the same qualities as a good sermon, and it would probably be idle to attempt any clear distinction between them.

Those who heard the Goulstonian lectures on the pathology and treatment of anæmia given lately at the Royal College of Physicians of London by Dr. L. J. WITTS, of Guy's Hospital, will we believe appreciate the reasons for the foregoing reflections. Those who read them in this and the preceding numbers of THE LANCET will do no more than recognise a singularly interesting account of a subject which has advanced greatly in recent years. It is not so long ago that there were only three sorts of anæmia—pernicious, chlorosis, and secondary. And if nothing fresh had since been added there would now be only two, for chlorosis has disappeared; we should dearly like to have it back for a while that it might be investigated by modern methods. It is possible, but sadly unlikely, that some cult of Victorianism among young unmarried women may bring it to light again. Dr. WITTS in fact does not mention it at all, which is perhaps why he also omits all reference to the distinction, made so clearly in chlorosis by LORRAIN SMITH, between anæmias due to an excess of plasma and those in which there is a real defect in the hæmoglobin of the erythron.

The most important contribution to our understanding of the anæmias is we think his attempt to bring together a whole series of apparently different conditions under the general heading of anæmia from defective nutrition or disordered assimilation, with the idea that some specific substance or substances are needed for each of the developmental stages of the normal red cell. We have on the one hand the simple nutritional anæmia so common in infants, which, as Dr. HELEN MACKAY has shown, is due to the low iron and mineral content of milk and can be cured by a mixed diet and inorganic iron salts; these supply the substances which are necessary for the proper maturation of normoblasts into normal erythrocytes. On the other hand there is Addisonian pernicious anæmia in which the stomach fails to secrete a ferment which produces from meat a substance, normally stored in the liver and kidneys, which is necessary for the development of megaloblasts into normoblasts; intestinal derangements which prevent the absorption of this substance may have the same effect when the gastric juice is normal. The due differentiation of the blood-cells is as it were blocked at a certain point and, as Dr. WITTS points out, the accumulation of iron in the liver and spleen is due not so much to excessive destruction of red cells as to the failure of the marrow to make use of the materials for making fresh red matters, for many medical men feel that they are in the same position, and require to give more intensive consideration to the different aspects of sex and family relations before their views should be allowed to influence the lives of others. For this reason it seems possible that of those seeking the bureau for assistance as many may be directed there by their doctors or their clergymen as will find their way there independently.

HEALTH OF THE NAVY IN 1930.

THE statistical report of the Health of the Navy for the year 1930,[1] the first to be signed by Vice-Admiral R. St. G. Bond, has just been issued. The total force was 88,840 (86,240 in the preceding year), marines at headquarters being included for the first time. The fresh cases were, per 1000, 428·08 (482·03), the invalids 12·55 (14·30), and the deaths 2·47 (2·94), all showing decreases. Important causes of loss of service were local injuries and wounds, acute gonorrhœa, and, with less loss, catarrh. The chief causes of invaliding (total, 1115) were pulmonary tuberculosis 202 (228), diseases of the eye 199 (170), diseases of the ear 91 (132), injuries 80 (105). Deaths were 220 (254), their chief causes being injury 94 (92), pneumonia 16 (21), pulmonary tuberculosis 13 (19), heart disease 13 (7), and diseases of the intestines 12 (15). There were no deaths from enteric this year or last, but 7 (12) from meningococcal infection. Of the deaths from injury, 39 (42) were due to drowning; there were 14 (9) suicides. Of cases of illness, 11 (5) were due to the enteric group, 383 (1661) to influenza, 388 (539) to malaria, 5 (14) to Mediterranean fever, 115 (179) to pneumococcal infection of the lung, 78 (100) to pyrexia of uncertain origin, 118 (128) to rheumatic fever, 47 (81) to sandfly fever, 1 (2) to small-pox (a slight case, sent back to duty in 19 days), 203 (240) to tuberculosis of lung, with 13 (20) unclassified. New venereal infections were 5154 (5342), a definite reduction. From the new tables we gather there were 5 cases of encephalitis lethargica; single cases are mentioned of blackwater fever, relapsing fever, tetanus, and of schistosoma from the Mediterranean, though none from China. The death-rate from disease (1·26) is the lowest hitherto recorded. The successful preventive measures in *Delhi* for her cruise up the Amazon (chiefly mosquito nets) are given in detail; no cases of malaria occurred. Of meningococcus infection the largest group was 6, from *Pembroke*, depôt-ship at Chatham. Eight years ago we observed[2] that there was no special notice taken of tuberculosis in the health reports of the Services, though the disease was causing them a loss of 721 men annually. Much attention has been paid to this subject meanwhile, but if we go back to the Navy Health Report for 1921, then current, and compare its figures with those for 1930, we see little evidence of improvement; there are indeed slightly more cases and more invalids.

Statistics of Tubercle in the Navy per 1000.

	Cases.	Invalids.	Deaths.
1921	2·36	2·23	0·28
1930	2·42	2·36	0·16

Tuberculous cases and invalids are almost, as we see, the same people, and as the Navy publishes a most useful list of the ages and length of service of all invalids, the distribution of cases in the service can be readily calculated. It emerges that since 1921 the distribution of cases has been changing. Half the men in the Navy have under 10 years' service, and half have more. In the years 1921–24 the tuberculous invalids of under 10 years' service averaged 123, those of over 10 years' service 71. In the years 1925–30 there were on an average 105 of under 10 years' service and 96 over. It would appear that the men on the whole are developing tubercle later in life. Either there is a greater risk of contracting tubercle in the Navy as service continues, or the improved hygiene of to-day strengthens the resistance of those fated by their childhood's experiences to develop tubercle and delays its appearance. The question certainly deserves discussion. It must not be forgotten that the death-rate for tubercle among men in England and Wales rises pretty regularly from age 15 to age 55, so these men are serving at the most susceptible ages, and that there is a school of medical opinion which holds that most of the tubercle of the Services has come into them from civil life. Of the great groups of the Service, marines, with 1·16 cases per 1000, were least attacked in 1930, seamen, with 2·49 cases per 1000, the most. There are fewer cases of venereal disease this year, though more days under treatment, but these are only a fifth of the total from all diseases and injuries; formerly they were a third. The long accounts of work being done in pathological and other laboratories have interest, but the first-hand clinical reports of cases and epidemics seen on foreign stations, the special characteristic of the old reports, are excluded to-day, which is a great loss. Much information of value was extracted from them in the Croonian lectures of last year. The note on diphtheria strongly supports the slogan, "Prevention pays!" The cases of diphtheria at Greenwich Hospital School used to cost about £1500 a year, but thanks to Schick-testing and immunisation there are now no cases; to maintain this condition costs but £30 a year or less. Reports from Malta support Ziemann's view[3] that leguminous crops which form coumarin are a great protection against malaria, and that it is their presence that protects Malta from malaria. At Haslar, which has 150 more beds this year, an electrocardiograph has been installed. The many mosquito-breeding places that surround the hospital are utilised for training surgeon-lieutenants in antimosquito work. The volume of dental work is continually increasing. There is still no mention of the health condition of the cadets at Dartmouth.

ANTIMENINGOCOCCAL SERUM IN CEREBRO-SPINAL FEVER.

THE scheme designed by the Ministry of Health[4] to determine the value of serum treatment during the present prevalence of cerebro-spinal fever has failed as yet to secure really useful records, and a new leaflet has been issued to medical officers of health explaining why. A particular object of the scheme was to compare the potency of different serums in current use. Through the courtesy of medical officers of health, hospital medical officers, and medical practitioners, over 300 individual case records have already been received; the variation in the methods of using the serum have made them difficult to compare. The doses of serum given, the period of the disease at which serum treatment was begun, and the time during which it was continued, have differed widely from the practice of serum but also within the giant cells, in the walls of tuberculous cavities, in the sputum of phthisical patients, in degenerated "scrofulous" glands, in "fungous" joints, and in the bones of tuberculous cattle. They were never absent in the granulomas produced by inoculation of tuberculous material even in animals of the most different species. More than this, he had already carried on an extensive series of cultural experiments which yielded striking results. Employing sterilised blood-serum from the ox as a medium, he had cultivated the bacillus from fresh miliary tubercles, and had kept some of these cultures going for 200 days. More than this, he had gone far to satisfy himself of the validity in the case of tubercle of the postulates for a specific infection which have since been known by his name. It is a curious and rather painful reflection that much of what Koch had actually discovered before he made his demonstration to the Berlin Physiological Society was overlooked by his successors, and was "rediscovered" afterwards in various research laboratories. In a commemorative address [1] Pfeiffer remarks that the intervening 50 years have added scarcely anything material to Koch's work. Having definitely established the parasitic nature of tuberculosis, Koch went on to consider whence the organisms came and how they got into the body. From the fact that the bacilli develop within a narrow range of temperature, roughly 30° to 41° C., he deduced that the organism is a true parasite, incapable of developing outside the body. He regarded the germs as entering the system by the inspired air, possibly adhering to the particles of dust which are carried along with it, and he discussed with great discernment what can be learnt from the fact that to render an animal with certainty tuberculous he had to insert the infective material into the subcutaneous tissue, the peritoneal cavity, or the anterior chamber of the eye, infection from the surface of a wound only occurring exceptionally.

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[1] Statistical Report of the Health of the Navy 1930. H.M. Stationery Office. 1932. Pp. 148. 2s. 6*d*.

[2] THE LANCET, 1924, ii., 664.

[3] See THE LANCET, 1931, ii., 255.

[4] Review of Certain Aspects of the Control of Cerebro-spinal Fever (Ministry of Health Reports on Public Health and Medical Subjects, No. 65).

Koch's announcement spread over the prescient world with astonishing rapidity. It was on May 8th, 1882, only six weeks after the original communication, that Mr. Watson Cheyne demonstrated in the pathological laboratory at King's College, London, the bacilli brought over to England by Dr. Goltdammer, Koch's private assistant, when among the 70 people present were Lister, Wilks, Pye-Smith, and Beale. A culture of tubercle on blood-serum was shown on May 10th at the soirée of the Royal Society of London. Thereafter the tubercle bacillus soon became familiar to every medical student, not, it is true, in the original blue-brown method, but in the familiar garb of scarlet introduced by Ziehl and modified by Neelsen. It was a simple matter to try other mordants than potash, which was soon replaced by aniline water with gentian-violet, and then carbolic acid with fuchsin. To add only two scraps of history. It was Samuel West who first did routine tests for tubercle bacilli in sputum, at the Victoria Park Hospital. Vincent Harris, who was then remounting specimens of diseased lung in the museum of St. Bartholomew's Hospital, was able to demonstrate in sections, some of them 50 years or more old, the presence of tubercle bacilli almost every time. And so in every country Koch's teaching was a similar turning point in the relation of humanity to disease. Economic conditions in Germany have led to the postponement to 1933 of any large-scale jubilee celebration, but during the last week or two the chief general and special German medical papers have contained appreciative articles.

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[1] Med. Welt, March 5th, 1932, p. 325.

ANNOTATIONS

SEX EDUCATION

We publish this week a letter from the honorary medical secretaries of the British Social Hygiene Council announcing a departure on the part of the Council which may prove to be of wide utility. That many of the troubles arising in connexion with marriage would be prevented by greater physiological knowledge on the part of the contractors has been recognised by the medical profession for literally ages, and by a considerable proportion of thinking laymen for at least a century. To-day it has become universal knowledge, and a profuse literature is available for the public digestion purporting to give the necessary information. The quality of these books varies much, but far more of them are useless than useful, some are mischievous, and some are designed to bring the return in money earned by salacity. Knowing the unsatisfactory nature of many of these books, it is good to learn that the Council proposes to publish an authoritative manual dealing with the personal problems arising out of marriage, while they are also approving of an arrangement by which those in need of private advice can obtain the aid of the secretary general of the Council, at a bureau of consultation. The "Personal Problems" bureau will be under Mrs. Neville Rolfe in her individual capacity, and will be established on a commercial self-supporting basis, part of any profits accruing being given to the Council for its general purposes. We understand that the bureau is intended to have a larger scope than the consideration of difficulties incidental to marriage. Parents, for example, who may wish for assistance as to practical methods in the sex-training of their children will also be welcomed, and afforded advice of the sort that, for this reason or that, they no longer seek as a matter of course from the doctor or clergyman. With regard to the assistance of ministers of religion in settling questions of the sort, the report of a Lambeth Conference has now definitely stated what the public had for some time come to think—namely, that on such subjects as preparation for marriage admonitions could not be given by unmarried clergy with much chance of their being sensible. More than ever is this true now that the sex education and sex adjustment have been diligently studied as special subjects. It is not only clergymen, married or unmarried, who are unlikely to have at their disposal sufficient knowledge to give sound advice in such of infection and resistance. About three-quarters of adults in Melbourne have in their serum a substantial amount of antitoxin.[5] Of 91 new-born infants, 76 (83 per cent.) were similarly endowed, but only 10 of 51 children (20 per cent.) from 4 months to 2 years; the grown-up condition is reached at about 7 years. The tale is evidently the same as with diphtheria. The changes and chances of communal life lead to infections and subinfections which produce *an active immunity in the majority* of people, with or without any memorable illness. The human placenta being what it is, these antibodies are transferred from mother to fœtus and carry the infant through its first few months. They then fade away and the child is left to develop its own individual immunity.

DIPHTHERIA PREVENTION IN LONDON.

THE progress of active immunisation to diphtheria in the British Isles and in New York is recorded by Dr. J. Graham Forbes in an interesting section[6] of the annual report of Sir Frederick Menzies, medical officer to the London County Council, on other sections of which we have already commented. In Metropolitan and Greater London up to the end of 1930 a total of 35,835 children at welfare centres or in residential institutions, and 7552 members of the nursing staffs of hospitals, chiefly fever hospitals, had either been inoculated or were known to be immune—a grand total of 43,387. Corresponding figures for 1928 show that the numbers tested have been more than doubled since then, and those immunised have increased over two and a half times. Can this achievement, having regard to the size of the population of London and the incidence of diphtheria, really be regarded as satisfactory? In New York City, according to Dr. Forbes, the determined efforts of the public health authorities to control diphtheria have been developed as a carefully coördinated scheme which included all concerned in the care of children, and as a result the numbers of children now immunised have been increased by over 380,000 in 1929 and 1930. In 1930 in New York City there were 3794 cases of diphtheria with 198 deaths. Of the fatal cases only four patients had previously received protective inoculation, in two of them within a month before attack. In the County of London in the same year there occurred 13,361 cases of diphtheria with 455 deaths, an increase over the previous year of 1708 cases and 104 deaths. In the outer ring of Greater London during the same year 4506 cases of diphtheria occurred with 190 deaths. The County of London in 1930 experienced approximately the same incidence of diphtheria, although the fatal cases were considerably fewer, as New York City, in 1927, before the intensive campaign commenced. In that year there were 13,507 cases of diphtheria with 717 deaths in New York. In Metropolitan London, Holborn Borough Council, on the advice of its medical officer, Dr. C. W. Hutt, provided facilities for testing and immunisation as far back as 1922, and was followed by 13 other metropolitan boroughs at various dates from 1926 onwards. Two of these boroughs, Finsbury and Poplar, have closed their immunisation centres owing to lack of demand. Finsbury had the highest diphtheria attack rate—namely, 4·63 per 1000—in Metropolitan London in 1930. Poplar's rate was 3·67 per 1000, the London mean attack rate being 3·03 per 1000. The total numbers of children dealt with at some of these metropolitan borough clinics since their opening are lamentably small. In certain districts of Greater London, notably Heston and Isleworth, Wood Green, and Ilford, the prospects are much more cheering. Dr. E. H. T. Nash and Dr. Guy Bousfield recently described[7] the details of an immunisation campaign in Heston and Isleworth and its results. The great success of this work may be ascribed to propaganda devised upon the assumption *that the public to be influenced was intelligent*, and to great frankness. Care was taken to make no extravagant promises of success. The response exceeded expectations, and Dr. Nash and his colleague are to be congratulated upon the results of an active policy well devised and carried out. In the absence of effective propaganda and coördination of effort by all concerned in the welfare of children, active immunisation against diphtheria can hardly be expected to make the progress which it obviously does make wherever its value is properly presented to the public.

THE DIFFERENTIAL DIAGNOSIS OF PULMONARY TUBERCULOSIS.

THE complaint is often made that State interference in the treatment of tuberculosis has robbed the hospitals of the clinical material necessary for the instruction of students, and the general practitioner of interest in patients for whose care he has only a divided responsibility. The loss of the student and general practitioner has been the gain of the tuberculosis officer, whose special knowledge may compensate for the relative ignorance of his colleagues in districts where a close connexion is maintained between the practitioner's surgery and the officer's dispensary. The patient however must pass from the panel to the dispensary, and if the practitioner is not qualified to recognise the signs of incipient disease he may not come under the care of the tuberculosis officer till all hope of cure has vanished. Dr. Philip Ellman, realising the danger of the new situation, has written a book[8] designed to help the general practitioner who feels that he has lost touch with modern ideas on the subject of tuberculosis, and to bring his knowledge up to date. Dr. Ellman is concerned not with scientific theories, but with clinical observations, and his teaching is lucid and practical. He stresses the importance of radiology in the diagnosis of chest disease, and the numerous radiograms illustrating morbid conditions have been selected with discrimination and are well reproduced. The description of collapse therapy provides all that is necessary for an understanding of a valuable method of treatment, the carrying out of which must of necessity be left in the hands of those who have had special training. The chapter on the pulmonary diseases of childhood is less satisfactory. The practitioner to whom this book is addressed may be disappointed to find only 20 pages devoted to a subject that is beset with difficulties and which is of such vital importance to him. Though numerous references would be out of place in a work of this kind, a short bibliography would have added to the value of a book which is not a text-book dealing with the diagnosis, prognosis, and treatment of diseases of the chest as met with by the general practitioner, but a description of modern methods in the differential diagnosis of chronic pulmonary disease with special reference to pulmonary tuberculosis.

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[5] Bryce, L. M., and Burnet, F. M.: Ibid., p. 183.

[6] L.C.C. Ann. Rept., 1930, vol. iv., Part III. P. S. King and Son. No. 2877. 5s.

[7] Medical Officer, Jan. 16th, 1932, p. 25.

[8] Chest Disease in General Practice, with Special Reference to Pulmonary Tuberculosis. By Philip Ellman, M.D., M.R.C.P. London: H. K. Lewis and Co., Ltd. 1931. Pp. 266. 15s.

treatment as set out in the Review, which followed the original indications given by Flexner and many subsequent authorities. These authorities advocate lumbar puncture as soon as the disease is suspected, and the intrathecal injection of serum without waiting for bacteriological confirmation or typing. The doses should be about 30 c.cm. (or 10 c.cm. of concentrated serum) for adults, and only slightly less for older children; general anæsthesia increases the amount of cerebro-spinal fluid obtained, and hence the injection of full doses of serum without risk of increasing the intrathecal pressure. The injection should be repeated every 24 hours for three or four days, until convalescence is obviously established, and recommenced if relapse occurs. Though individual cases require exceptional treatment, any great divergence from accepted practice obviously reduces the value of case records collected for the purpose of assessing the therapeutic potency of the serum now available, and of contrasting the curative effect of one serum with another. Less than half of the records hitherto received show evidence of even approximate compliance with accepted practice. It is very desirable that the further case records furnished should, wherever necessary, be accompanied by some notes of the reasons which have seemed to make it impossible or undesirable in the particular case to give serum early enough, in sufficient doses, or sufficiently long to secure its full benefit. The case reported by Dr. Burton in our present issue emphasises both the message that long-continued treatment is required, and that treatment cannot always be on routine lines. The patient described, after being in hospital for more than 17 weeks, during which time he had two relapses, made a complete recovery, mental and physical, but not until 78 lumbar punctures had been performed and 2601 c.cm. of cerebro-spinal fluid removed. The serum seemed to have little specific action in this case. A variation of technique to meet special circumstances must obviously continue, but while this inquiry is in progress an obligation rests on medical men to adopt a scheme which will make their results comparable unless this is definitely contra-indicated.

CURABILITY OF CANCER OF THE STOMACH.

THE prognosis as regards cure of cancer of the stomach is poor, yet D. C. Balfour,[1] of Rochester, Minn., is able to present an analysis of 128 patients, operated upon between 1910 and 1920, who survived partial gastrectomy for ten years or more. It was found that the cancer was removable in 19 per cent. of the cases seen, and of those in which it was resected about 20 per cent. survived for at least ten years. A. J. Walton,[2] in a series of 62 partial gastrectomies, found that only four (including one case of sarcoma) survived four years or more in spite of radical operation, whereas in some of the cases reported by Balfour only a local excision was done, and of these six survived the ten-year period. The grading of the tumours in the 128 cases "cured" confirms the value of microscopical grading as an aid to prognosis and as an indication for resection. The site of the tumour has a marked influence on the possibility of removal. Lesions at the upper limit of the lesser curve are very unfavourable, and from the study of these 128 cases Balfour finds that lesions of the antrum are less favourable than those of the body, since in the pyloric region the lymph glands are extensive, early involved, and less easily completely removed. The delay in diagnosis is not to be attributed to the clinician but to the insignificance of the early signs and symptoms, and therefore one thorough radiographic examination is not sufficient and repeated examinations must be made if necessary. Apparent good health, a normal test-meal, no loss of weight, and no palpable tumour do not rule out cancer of the stomach. The general rule is that exploration should be carried out unless irremovable metastases can be demonstrated, and it is to be remembered that a large gastric tumour by no means contra-indicates operation. On exploration the uninvolved portion of the stomach above a large tumour may be rigid and thick, and this condition may wrongly lead the surgeon to decide against resection. Balfour considers that it is at times good practice to disregard involvement of the lymph nodes, since a patient may be cured even if all the involved glands are not removed. H. Hartmann, on the other hand, who reports 31 per cent. of three-year cures in 125 cases of gastrectomy, attributes his comparatively good results to his great care in removing those groups of glands most subject to invasion.[3] Balfour's last 200 cases of partial or total gastrectomy for cancer showed an operative mortality-rate of 5 per cent.

STAPHYLOCOCCAL INFECTIONS.

So many infections with staphylococci are of a comparatively trivial character that the capacity of these organisms for evil and the possibility of coping with them by serological methods have been rather overlooked. Staphylococcal septicæmia is not common but it is extremely fatal, the mortality being about 75 per cent., or even more. In the Bundaberg disaster 21 children were inoculated with a contaminated diphtheria toxin-antitoxin mixture and 12 of them died in a day or two from staphylococcal septicæmia. From this tragedy came Burnet's study [illegible] toxin and the preparation of an [illegible]. and his work has lately been re-examined and confirmed by Drs. H. J. Parish and Winifred H. M. Clark, at the Wellcome Laboratories at Beckenham.[4] The organism produces its toxin best in an atmosphere containing a good deal of CO_2, a cultural detail no doubt responsible for its toxigenic capacity having been overlooked for so long. The toxin is very poisonous to experimental animals; it is also conveniently hæmolytic so that it may be titrated in vitro as well as in vivo. Rabbits and horses may be immunised by a course of progressive doses either of the fresh toxin or of toxin which has been detoxicated with formalin. The sera thus prepared protect animals against fatal quantities of toxin, and they show some capacity to prolong the life, and sometimes prevent the death, of rabbits inoculated with live cultures; in this respect, however, there is obviously room for improvement. It seems likely that the leucocidin to which Drs. P. N. Panton and F. C. O. Valentine drew attention in our issue of March 5th (p. 506), and which is distinct from the hæmolytic toxin, needs neutralisation too, and this is no doubt within the possibilities of serum therapy. Bacteriologically the problem has a fruitful appearance, and it is to be hoped that adequate clinical trial will be made of the sera which are available, and of the active immunisation with toxoid which has been briefly explored at the London Hospital.

This renewed interest in staphylococci has also contributed useful information on the natural history

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[1] Surg., Gyn., and Obst., Feb. 15th, 1932, p. 312.

[2] THE LANCET, 1928, ii., 438.

[3] Ibid., Feb. 20th, 1932, p. 410.

[4] Jour. Path. and Bact., March, 1932, p. 251.

SPECIAL ARTICLES

PULMONARY TUBERCULOSIS IN CHILDHOOD.

BY F. J. BENTLEY, M.D. DURH., M.R.C.P. LOND., D.P.H.,

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ATTENTION has been focused of late on pulmonary tuberculosis in the child, expecially of school age, and in some quarters there is a feeling that study in this direction may go far to solve the problem of adult tuberculosis. In this connexion two questions spring to mind. Firstly, does indeed the tuberculous child grow up to help to fill our sanatoriums in adult life? Secondly, is the "A," or negative sputum, case in childhood of great importance, or can we afford to pay less attention to this and concentrate on the "B," or positive sputum cases?

The London County Council records show that out of the 4189 pulmonary and non-pulmonary patients coming under treatment for the *first time as adults* during the year 1930 only 25 were known to have received treatment under the Council's scheme for pulmonary tuberculosis during childhood. Of these 25, 11 were definitely positive sputum cases when treated as children, and all except one of the remainder showed undoubted involvement of lung tissue though tubercle bacilli were not demonstrated in the sputum. Looking at the question from another angle, it is significant that the after-histories of children with positive sputum are markedly different from those who do not cough up tubercle bacilli. Thus, taking the "A" cases who were discharged from treatment in 1924, we find 92·9 per cent. alive and well at the end of five years, whereas at the end of the same period only 15 per cent. of the "B" children were still surviving.

These figures are mentioned not by any means as exhaustive, but they do indicate that the disease that causes such concern in adult life occurs for all practical purposes de novo, and that clinical tuberculosis in the child is but little related to it. Also that "A" cases generally in childhood do very well, and that those indefinite cases that are, perhaps still too often, notified as suffering from pulmonary tuberculosis need cause little alarm.

The positive sputum cases in childhood are, on the contrary, very grave, and it is well to consider their occurrence and to ponder if more can be done to detect them earlier, or, better still, to prevent them.

Every year in London there are about 60 applications for residential treatment of such children below the age of 16, the great majority being new cases. These represent practically all the new cases coming on to the dispensary registers; during 1930 only three additional cases were known to the dispensaries for which residential treatment through the Council's tuberculosis scheme was not sought. The incidence in London as shown by the actual number of deaths recorded is as follows:—

Deaths from Pulmonary Tuberculosis. London, 1930.

Age-group.	Males.	Females.	Total.
0–5	20	17	37
5–10	8	9	17
10–15	14	27	41
0–15	42	53	95

These figures may include a few negative sputum cases and some cases especially below the age of 5, in which the diagnosis may have been in doubt, but the majority must have been positive sputum cases.

An Investigation.

It will be seen that this condition is fortunately very rare. With the willing help of the metropolitan borough tuberculosis officers and the London County Council school medical service, it has been possible, however, to survey a group of 48 consecutive cases of pulmonary tuberculosis with positive sputum occurring before the age of 16. Certain factors have been analysed.

Sex.—There were 36 (75 per cent.) females and 12 (25 per cent.) males. This female preponderance is in accord with the excess of girl sufferers, chiefly above 12 years of age, which is constantly seen throughout the world.[1] My figures, however, indicate a more striking contrast than is actually the case as shown by the death-rates from tuberculosis for the whole of England and Wales.

It has been thought that the greater strain of puberty and adolescence in the female accounts for a good deal of this increased incidence, but whilst it has been popular to speak of this "strain" in many connexions, it has not been decisively demonstrated and possibly it is not important. The health officer of Calcutta in his report[2] for 1929 says that five girls die from tuberculosis between the ages of 10 and 20 for every boy; he insists that the most important factor in the ætiology of this disease in young girls in India is early marriage with its accompanying strain; but the predominance of the disease in females in England starts in the 5–10 year age-period. It may be that the closer contact that usually exists between female children and the other members of the family gives rise to greater possibilities of infection, or explanation may be found in the girls of this age already doing housework and generally not being so much in the open air as the boys.

Age.—As regards age at notification, one case in this series was 7 years of age, but, excluding this, the youngest was 10, whilst the average age at onset was 14; 64 per cent. of all the children were 14 or more. It will be seen, therefore, that half the cases are first diagnosed *after* leaving school.

Previous illnesses and mode of onset.—These children had mostly suffered (together with the majority of their school-fellows) from the specific infectious fevers, and had commonly had measles, whooping-cough, scarlet fever, bronchitis, &c. Cough and lassitude were the initial symptoms most frequently noted. It is interesting to learn from the school medical histories that some of these children were apparently healthy and robust before the onset of their symptoms. Some were apparently perfectly fit until the week or two before notification of the disease; two were keenly engaged in athletic pursuits, including swimming. It has been shown that there is no co-relation between tuberculous infection as determined by the tuberculin test and diminished body-weight[3]; recent work in America suggests that the influence of malnutrition generally has been overrated.[4] We must look therefore for the earlier cases of this disease just as much amongst those who are apparently healthy as amongst those who are debilitated.

Delay between onset of symptoms and diagnosis.—In over half the cases the period between onset of obvious symptoms and diagnosis was less than eight weeks. In only nine cases was there more than three months' delay. It is well known how loth many people are to consult a doctor when ill-health is first noticed. Generally we must consider that as soon as these

THE VALUE OF INTRACARDIAC INJECTIONS OF ADRENALIN.

THE efficacy of adrenalin injection into the heart in asphyxia has recently been disputed. Sir E. Sharpey-Schafer, F.R.S., and Mr. W. A. Bain describe[1] experiments on cats designed to test the value of such injections. A simple asphyxia was produced by occluding the trachea, the animals being anæsthetised with urethane. It was sometimes possible to revive the animal after the circulation and respiration had ceased by artificial respiration, provided the interval had not been too prolonged, though mere renewal of the air in the chest through a tracheal tube might have no effect. It was shown that where this latter procedure had failed, intracardiac injection of adrenalin quickly caused the heart to beat again. The blood pressure rose rapidly from zero to high levels, and then natural respiration was resumed. The recovery is attributed by the authors to the stimulating action of the adrenalin upon the arrested heart. Blood is pumped through the aerated lungs, and the asphyxiated bulbar centres are restored to their normal condition. The drug also acts upon the arterioles, and it is their contraction which causes the high blood pressures observed, and maintains the pressure at a sufficient level. These striking effects are most rapid if the injection is into the myocardium; if it is into one of the heart cavities they are produced more slowly, as the adrenalin then has to traverse the aortic and coronary systems—and if into the right heart the pulmonary system in addition—before it reaches the heart muscle. It was shown that in rare cases an adrenalin effect can be obtained with heart massage and artificial respiration without an actual injection. This appears to be due to the passage towards the heart of adrenalin-containing blood which has stagnated in the suprarenal veins in consequence of the failure of the circulation, and as a result of the intermittent pressure applied to the thorax and abdomen becomes driven to the heart. The work gives clear confirmation of the value of adrenalin as a stimulant to the heart and to the whole vascular system.

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[1] Proc. Roy. Soc. Edin., 1931–32, lii., 139.

NAKED AND UNASHAMED.

A LETTER appears in last Saturday's *Times* pointing out that "active air-bathing" is extremely beneficial to the health and happiness of the indoor worker. The 22 signatories urge that the movement in its favour needs to be rescued from the ill-informed scorn and disrepute from which it has suffered, and that air-bathing should be raised to the level of other healthy recreations. There should be the same liberty with regard to clothing (away from the public highway) as is now allowed on the stage; "public authorities could well set aside grounds for air-bathing exercises; private people could well make similar use of their own grounds; light and air sports clubs could be founded, and so on."

On first consideration, the idea of a community of people deliberately practising nudity, especially with municipal encouragement, strikes the average person as somewhat ridiculous. Arguments commonly advanced are that nakedness is practised by savages, not by civilised races; that most people are ugly when stripped of their clothes; that nudity is indecent, and when practised between the sexes inevitably leads to promiscuity. But the discovery that the rays of the sun on the skin exert a beneficent effect on health has done something to undermine these prejudices. The thought of tuberculous children, now brown-skinned and active, tumbling about in Alpine snows is no longer disturbing, nor even the prospect of adults doing these things, as long as they are done for the sake of health and as long as the sexes are segregated. On the Baltic coasts public opinion is even more advanced, and nobody seems to be revolted by the spectacle of mixed bathing without garments of any kind. In England, however, most people would still regard such practices by civilised adults as barbarous and indecent. Not long ago Mr. Parmelee[1] attempted to expose the reasons for this condemnatory attitude. As is well known, anthropologists declare that it is suggestive dissimulation which is sexually exciting, not nudity, and what the anthropologist deduces from his studies, medical men and women learn from the more convincing process of personal experience. It is difficult to know to what extent perversions such as exhibitionism and scoptophilia are conditioned by the concealments of the body which are imposed by convention and by the mysteries and taboos it enjoins. Th major and minor neuroses which appear in civilise communities are now being thought of more an more in terms of repression, and it is argue to-day that many of these repressions can be averte by educating children differently, particularly i their early years. It is quite possible that a chang of attitude towards the body—one's own body an other people's—such as is implied in the disseminatio of gymnosophic ideals, might, without the leas harm to society, do much to dissipate superfluou and injurious repressions. Certainly the publi exposure of the body, undefended by clothes and th dignities of rank which they indicate, is an urgen inducement to physical perfection. And although th signatories of the *Times* letter may long for offici recognition inland, they are obviously fighting winning battle along our coasts each summer.

Lord Dawson has been re-elected president of t Royal College of Physicians of London.

Sir Henry Dale, F.R.S., has been reappointed member of the General Medical Council on t nomination of the Crown.

WE regret to announce the death, on Wednesda of Dr. R. M. Bronte, well known for his work connexion with medico-legal cases. He was path logist to Harrow Hospital and the Samaritan Fr Hospital for Women.

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[1] *Nudity in Modern Life.* By Maurice Parmelee. Londo Noel Douglas. 1929. Pp. 303. 12*s.* 6*d.*

DOWN COUNTY MENTAL HOSPITAL: NEW PHYSI THERAPEUTIC DEPARTMENT.—The mental hospital at Dow patrick has always been one of the foremost in Ireland, and its convenient block-system design, its separate reception h pitals, and its occup [illegible] has now be added an up-to-dat [illegible] he new buil ing was opened on [illegible] r of Northe Ireland and the Duchess of Abercorn. Its equipme includes carbon arc and mercury-vapour lamps, a Sch pantostat, a vario-frequency diathermy machine, Vic and Aix douche massage baths, needle and spray bat Plombières douche, and full X ray outfit and dark roo The Governor switched on the dynamos and opened t new department with a gold key, and the Duchess then opened an extension of the occupational therapy department, where weaving, basket-making, rug-making, and art work of all kinds are to be provided for patients who are unsuited for work on the estate or in the workshops.

Of these children under survey, 42 per cent. belonged to families that had already shown at least one previous case of tuberculosis. This information about contacts was not considered sufficiently accurate, and special inquiry has been carried out to ascertain whether the contact in these cases has been with a non-pulmonary case or with a pulmonary case and, if the latter, whether the first case in the family was coughing up tubercle bacilli or not and whether living or dead, and 73 further cases have been investigated in this particular direction. The additional cases have occurred consecutively with each other and with the original 48. No selection has been made beyond the fact that all the children were sputum-positive cases of tuberculosis.

Analysis of these 121 cases shows that in 53 (44 per cent.) there was a history of a previous case of tuberculosis (pulmonary or non-pulmonary) in the household, but I will confine myself to a consideration of contact only with definite cases of pulmonary disease, alive and known to the dispensaries and presumably notified, and with cases that had died from this disease within the preceding five years. But before doing so I want to indicate approximately in how many school-children one might expect "normally" to find a history in the family of either notified living pulmonary tuberculosis or death from the disease within five years.

I wish to make it clear at this point that an accurate statistical survey is not being attempted here, and that such figures as I use now are put forward only to show the general trend of the argument.

At the end of 1929 in London there were 32,117 cases of pulmonary tuberculosis on the registers of the metropolitan boroughs. The total population was 4,417,900. There was therefore, one living case of notified pulmonary tuberculosis for every 137 people. From the 1921 census it is seen that out of a total London population of 4,484,532 there were 1,120,897 private families. Taking either a borough in which the children are all elementary school-children, such as Bermondsey (total population 119,452; total private families 28,610) or a densely populated borough such as Stepney (total population 249,657; total private families 55,832), and after taking into consideration the childless marriages and the single people living alone we cannot average more than five persons per family; it may be assumed, therefore, that throughout London there will be found one notified case of pulmonary tuberculosis in $\frac{137}{5}$ families; or, to put the matter another way, if we search the families of any 27 unselected elementary school-children, we may expect to find one living case only of notified pulmonary tuberculosis.

To include the possibility of history of death from pulmonary tuberculosis, it becomes necessary to add to the total number of living cases with which contact was possible the numbers of those who died from this disease during the years in which such history is to be taken into consideration. If we consider a family history of death from pulmonary tuberculosis within five years to be important, we must add 20,000 (five years × 4000 deaths per year) to the number of possibilities. The London population then would have 52,000 (32,000 + 20,000) "chances" of contact with a case of pulmonary tuberculosis, either alive and notified, or dead within the past five years—i.e., one in 85 $\left(\frac{4,417,900}{52,000}\right)$.

Thus one might expect to search the families of 17 $\left(\frac{85}{5}\right)$ school-children before finding either a case of notified pulmonary tuberculosis or history of a death from this condition in the preceding five years.

Converting these "normals" into percentages and comparing them with the incidence of previous pulmonary tuberculosis amongst the families of my 121 sputum-positive children, we find that, whilst 3·7 per cent. of normal school-children have in the family a living notified case of pulmonary tuberculosis, 14 per cent. of sputum-positive children show a similar family history; and whilst 5·9 per cent. of normal children have a case of notified pulmonary tuberculosis alive in the family or one dead within the preceding five years, 28·9 per cent. of sputum-positive children show similar contact with the disease. These contrasts are even more marked if the actual numbers of cases in the families of the affected children are taken into account, as in several families there had been more than one previous case of pulmonary tuberculosis either alive or recently dead.

It will be seen therefore that children from tuberculous households are specially liable to develop sputum-positive pulmonary tuberculosis.

Special Investigation of Contacts.

It becomes necessary now to consider what further can be done by specially investigating all such child contacts. It would mean a considerable work; would it be worth while?

Before answering this question let us see what is being done elsewhere. The work of Opie[7] and his colleagues in the United States is now generally familiar to tuberculosis workers in this country, and elsewhere in America similar intensive investigations by means of skin-testing and radiography on large groups of school-children have been carried out, as in Massachusetts[8] and in Chautauqua County, New York.[9] The Americans have not confined themselves to investigating contacts, but have combed through entire school populations, and they appear to think the results justify such a course, a large number of hitherto unsuspected children being found to be suffering from pulmonary tuberculosis either active or "latent."

It would appear therefore that more is being done in some parts of America with the help of tuberculin testing and radiography to find earlier cases of tuberculosis in children than we are doing in London, and it has been suggested by certain authorities that similar work should be started in this country.[10] [11] But the problem of tuberculous children in the States is very different from our task here. One point is fundamental and must not be lost sight of. Our children largely leave school at age 14, when there is very little serious tuberculosis to be found; above that age the incidence curve climbs steadily and steeply into the twenties; every year of adolescence provides an increasing number of cases. American "children" stop at school commonly until 16 years of age, and many of the high-school pupils are 17 and 18. At these latter ages tuberculosis becomes comparatively common, and the Americans find it. They find, in addition, many cases of so-called "latent" tuberculosis of uncertain significance. There is a real danger in labelling too many children as "suffering from" tuberculosis. We must not forget that there is a process of tuberculisation through which most children in our present civilisation have to pass.

How many real cases of pulmonary tuberculosis could we expect to find by investigating school-children in the "American" fashion? No group of school-children would provide more fruitful material than girls at school-leaving age who were contacts of either a living case of tuberculosis or in whose family there had been a recent death from the disease. I have said that one child out of 17 could be expected to fall into this group; out of 28,000 girls (school leavers in one year) of 14 years of age, a group of about 1600 "contacts" would be chosen. Now, whether we find them early or late, there are about 60 positive sputum children every year. Let us say that 45 of these are girls; let us say that 15 of these will be contacts; let us assume that all the sputum-positive children to be found cases show obvious ill-health, they are diagnosed quickly. As regards the *actual stage* (L.C.C. classification) reached by the disease when these cases were notified, 6 (13 per cent.) were B1, 31 (64 per cent.) were B2, whilst 10 (21 per cent.) were B3 cases. One case did not show tubercle bacilli when first notified and treated, but these were found on subsequent treatment in 1929 and again in 1930. In about three-quarters of these cases therefore, in spite of the short period of "delay," the disease had become moderately or hopelessly advanced before being diagnosed.

Present Organisation for Detection of the Disease.

In the London County Council schools, in addition to the routine medical inspections and the "specials," particular attention is paid to the contacts of cases of tuberculosis that are referred by the tuberculosis officers. The school medical and tuberculosis dispensary services between them form a network through which the whole school population has to pass, and in the case of "suspected" or "suspicious" children the net is kept very tightly drawn. Yet, in spite of this, an occasional case slips through. In considering reasons for this, we must not forget that many of these children had already left school. The possible very rapid spread of disease is also a factor. It is probable that some children develop into advanced cases in the matter of a very few weeks.

Another explanation of this occasional "missing" of early cases may be found in the very fewness of such cases. Very many physicians have never seen a child with positive sputum. The disease in children is so rare that even a tuberculosis officer may go right through a year without coming across a new case. When a bird is seen on the treetops it is a hundred times more likely to be a sparrow than a nightingale, and on the hundredth occasion the nightingale is likely to be passed over as yet another sparrow; similarly, it is not to be wondered at that tuberculosis with positive sputum in childhood, from the very fact that it is such a rare bird, passes sometimes unrecognised—at least until the bird sings out.

Yet another reason why some early cases slip through is that physical examination for pulmonary tuberculosis is frequently misleading, and that in many cases it is only possible to arrive at a diagnosis after an X ray examination. Apparently healthy children, with no obvious abnormal physical signs, may show a considerable degree of involvement of the lung on a radiographic film. Dr. Burton Wood says,[5] "Without X ray control, physical examination is inadequate, for X rays have proved beyond all peradventure how slender may be the connexion between physical signs and pathological conditions."

Theoretically it is possible, then, that some of these cases could have been diagnosed earlier if, because of certain suspicions, physical or historical, the children had been subjected earlier to X ray examination. It is always easy, however, and seldom helpful, to be wise after the event, and it could be said with some truth that it is quite impracticable to radiograph every child who shows suspicious symptoms or history. Symptoms, when present, of early tuberculosis are, as we have seen, unfortunately not at all specific to that disease; excessive fatigue is frequently the only complaint, and this, of course, may point to very many other conditions besides tuberculosis. Clearly to radiograph every such child means radiographing almost all children. Short of this, is it possible to indicate any group of children who would, in the result, repay such special examination? Has this disease any specially increased incidence in any group of children to which we can point?

Contact with Infection.

Consideration of this brings us again to the question of "contacts." Attention has been drawn to the special care paid to children who are household contacts of notified cases of tuberculosis; the scheme whereby such contacts may be actually "boarded-out" with foster-parents is familiar; why such schemes and precautions? To some extent because the medical profession generally feel that children living in close contact with advanced cases of tuberculosis are liable to infection and disease, to some extent because the lay public is quite sure that consumption is "catching." There is much evidence, however, indicating that whilst tuberculosis is a bacterial disease, infection, when it occurs, does not determine the onset of the illness; the germ is widespread, yet comparatively few develop the disease; the result of examination of all contacts of all notified cases of tuberculosis is very disappointing, that is to say, very few new cases of the disease are found amongst those people who should be most subjected to infection.

Prof. Saugman was unequivocal about this problem. He stated: "It is not dangerous for healthy adults to be coughed at by patients suffering from pulmonary or laryngeal tuberculosis."[6] This may be true (though I, personally, prefer not to risk it!), but can we say the same of children? Can infection be unimportant in the adult and yet important in the child? It is so in some other diseases. Adults may mix, with but little risk of infection, with cases of measles and chicken-pox, but children will find these diseases readily transmitted to them. It may be said that adults have probably had chicken-pox or measles and thereby have gained an immunity, whilst the child is yet virgin soil. In many ways is not tuberculosis analogous?

Pathological investigations and tuberculin reactions have repeatedly shown that few humans reach adult life without becoming infected with the tubercle bacillus. In children, however, the factors are entirely different; practically speaking, all children are born without tubercle bacilli in their bodies—their resistance has not yet been tested. They may be exposed early, and succumb to the first breath of infection, as, for example, an infant who, from contact with an open case of tuberculosis, gets generalised tuberculosis and dies, frequently with meningitis; they may not be exposed to any definite source of infection and may become tuberculised very gradually as they grow up without any untoward effects; or they may be kept, in the minority of cases, entirely free from tubercle bacilli. All variations are seen between early and massive tuberculisation followed by death, and gradual tuberculisation without symptoms and with subsequent resistance.

The late Sir William Osler drew the parallel between infection in tuberculosis and the parable of the sower, which illustrates effectively the importance of the individual resistance and the importance of the virulence of the bacilli. Always there are the two determining features, the soil and the seed; but I venture to suggest that whilst in adults the soil is paramount, the seed already having been sown, in children we must consider, much more, the seed. In other words, whilst in adults we may afford somewhat to neglect infection as determining the onset of tuberculosis, in children we must pay it no little respect. Childhood is the time of preparation of the soil, and during that time we must beware of the seeds that are sown.

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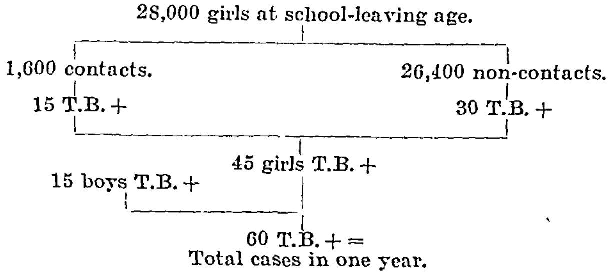
It is interesting to show the possibilities as below, for it also demonstrates the greater risk to contact children.



It is, of course, realised that a certain additional number of cases of pulmonary tuberculosis not showing tubercle bacilli would also be disclosed by such an investigation. Nevertheless, the number of sufferers discovered would be small. Investigate as we will we cannot find cases that do not exist.

Such investigation, therefore, hardly appears to be within the scope of the antituberculosis scheme of local authorities. Work of this description, however, should prove a fruitful source of research, as systematic examination of a group of specially susceptible children as indicated could not fail to reveal factors of importance. Children would be found apparently *normal at the time of investigation* who would develop definite sputum-positive disease subsequently; working backwards, then, to the original findings should, in certain cases, be the means of shedding light on equivocal factors and increasing knowledge about the earliest manifestations of the disease.

Summary.

(1) 48 consecutive sputum-positive cases of tuberculosis in children have been investigated with regard to, inter alia, the previous history and mode of onset, the period of delay between onset and notification, the exact stage reached by the disease at the time of notification, age and sex.

(2) 121 consecutive sputum-positive cases of tuberculosis in children have been investigated especially to ascertain the importance or otherwise of contact with other sufferers in the household. (These cases include the previous 48 children.)

(3) The present organisation for dealing with the problems concerned has been surveyed, and modern methods in operation in some parts of America have been discussed.

Conclusions.

A. Negative Sputum Cases.—(1) The great majority of negative sputum or "A" cases of pulmonary tuberculosis in childhood are alive and well after five years. (2) These cases only exceptionally develop clinical tuberculosis in adult life.

B. Positive Sputum Cases.—(3) The positive sputum cases of the disease in childhood are very rare. (4) When tubercle bacilli appear in the sputum of a child the outlook is grave. (5) Girls are affected much more frequently than boys. Whilst the appearance of positive sputum disease in any child under 16 years of age is rare, the condition below the age of 10 is a medical curiosity. The incidence rises with advancing adolescence, the curve ascending to the young adult peak in the twenties. (6) Children living in contact with open cases of tuberculosis in the household are in greater danger of developing the disease than children in healthy homes. (7) Children show a high degree of resistance to tuberculosis, as even child contacts, though they may show "infection" by tuberculin tests, seldom become affected by the disease. (8) When symptoms become obvious the disease is usually detected quickly. (9) The disease may be present for some considerable time, occasionally in apparently robustly healthy children, before symptoms proclaim themselves. (10) Even repeated physical examinations during this latent period fail frequently to demonstrate the trouble whilst it might be yet curable. (11) Radiography should succeed in some cases where ordinary methods of examination fail, and it should be employed in all cases where the suspicion of tuberculosis has been raised, before arriving at a negative diagnosis. (12) Suspicious symptoms, such as cough or lassitude, in a contact, especially in the older girls, should be the signal for an immediate and searching investigation. (13) Intensive investigation by means of systematic skin-testing and radiography on large groups of children on the *American lines* cannot be advocated generally in England. In a specially selected group of contact children, however, such work would prove a valuable research.

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11. Brit. Med. Jour. (Leading Article), 1931, i., 63.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE.

THE following appointments are notified: Surg. Lts. J. A. Browne to *Gnat;* and A. E. Flannery to *Tarantula.*

ROYAL ARMY MEDICAL CORPS.

Maj. J. A. Whitaker, Dental Surg., relinquishes his temp. commn.

H. C. M. Walton to be Lt. (on prob.) and is secd. under the provisions of Art. 213, Royal Warrant for Pay and Promotion, 1931.

ARMY RESERVE OF OFFICERS.

Lt. W. F. Roper resigns his commn. and retains the rank of Lt.

TERRITORIAL ARMY.

Col. H. H. C. Dent, having attained the age limit, retires and retains his rank, with permission to wear the prescribed uniform.

Capts. W. Barclay and J. F. O'Grady to be Majs.

Lt. E. C. Woodhead to be Capt.

E. Walsh to be Lt.

RESERVE OF AIR FORCE OFFICERS.

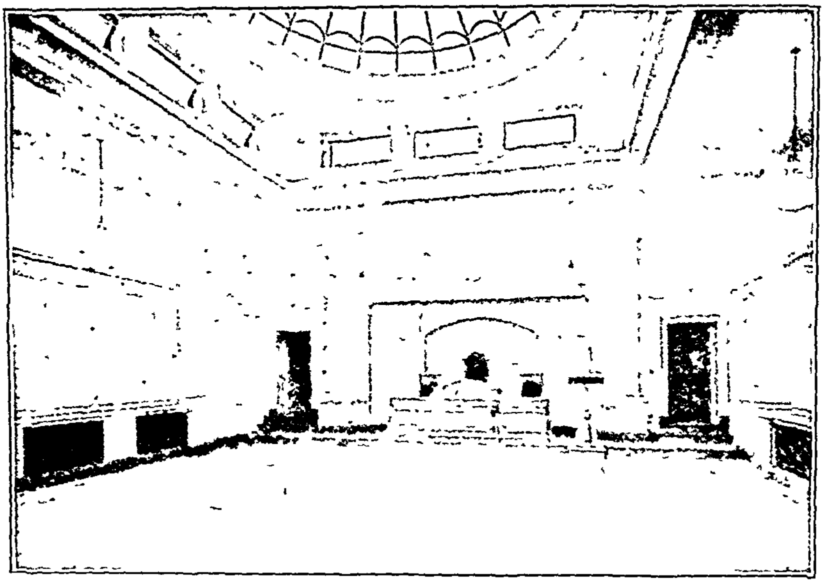
The undermentioned Flight Lts. relinquish their commissions on completion of service: *B. Pollard and G. J. Griffiths.*

OPENING OF MANSON HOUSE.

THE NEW HOME OF THE ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE.

MANSON House, the new home of the Royal Society of Tropical Medicine and Hygiene, was opened by H.R.H. the PRINCE OF WALES on March 17th.

Dr. G. CARMICHAEL LOW, President of the Society, in welcoming the Prince, welcomed also Sir Austen Chamberlain, who had helped the original appeal for funds in memory of the Father of Tropical Medicine, and so made possible the acquisition of Manson House. The Society, he said, had been founded in 1907 in order to centralise the various tropical medical activities both at home and abroad, and to give medical men who had worked in the tropics a place where they could meet and discuss their problems. The Society now had over 1700 Fellows, and more than 100 branches, all over the world. Its membership included representatives of medical, veterinary, and other sciences, and of practically every nationality, and by 1930 the Society had reached such dimensions that it was decided to establish it in a home of its own. Contributions to this end had been received from all parts of the world, and had made it possible to purchase 26, Portland-place, and to build in its "backyard" the beautiful hall in which the meeting took place. A further sum of £15,000 was, however, needed to meet the obligations in full.



The new hall of Manson House in Portland Place.

The PRINCE OF WALES, in declaring the house open, said that he had always been very interested in tropical medicine. This was not the first function he had performed for the Society, but he felt more fitted to perform it than he had on the last occasion, having since then been stricken with malaria. Some of his more hardened friends in Kenya were not displeased that he had had malaria, since his convalescence was speedy and the reports would be a good advertisement for the colony. Many of our possessions were in tropical regions, and the chief obstacle to our work in them was tropical disease, which was thus of the first importance. Much progress had already been made, largely owing to the effort of great pioneers who had studied tropical diseases on the spot, and had saved hundreds of thousands of lives. The pioneer name that came to their minds that afternoon was of course that of Patrick Manson, after whom the house had been named and whose widow was present. He was in fact the father of modern tropical medicine, and the practical effects of his genius were well illustrated in the completion of the Panama Canal. With the help of that far-seeing statesman, Mr. Joseph Chamberlain, Patrick Manson had founded the School of Tropical Medicine in London, and had been the first President of this Society. Conditions in tropical lands changed rapidly, and one of the most striking changes had been the improvement in communications. These would—unless precautions were taken—tend to increase the spread of disease, but would also advance the ability to control that disease. In this house those who had made discoveries and those who had gained experience would be able to pool their knowledge for the help of future workers.

Sir AUSTEN CHAMBERLAIN proposed a vote of thanks to the Prince for his continuous interest in the study and relief of tropical disease. He very well remembered the extent to which his father had been troubled by the toll of life taken by tropical disease. When the post of medical adviser to the Colonial Office fell vacant Joseph Chamberlain had sought the man in London who knew most about tropical disease, and his inquiries had soon led him to Sir Patrick Manson. Now London had facilities for the study of tropical disease which were unrivalled throughout the world. The death-rate in the tropics at the time Joseph Chamberlain went to the Colonial Office—1896—had been 100 *per* 1000 *per annum;* now it was between 8 and 9 per 1000. No work more beneficent to mankind had ever been done than that of Sir Patrick Manson.

Col. W. P. MACARTHUR, seconding the vote of thanks, mentioned a contribution to Manson House from a cricket club in Rhodesia, the members of which had realised that but for Manson they would not have been playing cricket under conditions almost as healthy as those in England.

The Prince of Wales then went on a tour of the building, an Adam house very pleasantly decorated in green, with oak panelling. On the ground floor is a comfortable members' lounge and a library which will, it is hoped, come to hold on its shelves a complete reference library of tropical medicine. There are also well-fitted cloakrooms, dressing-rooms, and offices. The upper part of the house and the garages are sublet, and provide a useful source of revenue. The well-proportioned hall (illustrated above) is panelled in cream and fitted with rows of brown stalls.

(including those who would *normally* be diagnosed at the later ages of 15 and 16) can be found in this age-group of 14, then we will "discover" 15 cases in 1600 children. As the assumption of finding all sufferers for that year at age 14 could, of course, not hold good, a much smaller number of children with disease would be found, and some of these would be discovered in the ordinary way by the methods and organisations at present at our disposal. Also, and this is very important, two-thirds of the problem —i.e., non-contacts—would remain untouched.

It is interesting to show the possibilities as below, for it also demonstrates the greater risk to contact children.

28,000 girls at school-leaving age.
1,600 contacts. 26,400 non-contacts.
15 T.B. + 30 T.B. +
45 girls T.B. +
15 boys T.B. +
60 T.B. + =
Total cases in one year.

It is, of course, realised that a certain additional number of cases of pulmonary tuberculosis not showing tubercle bacilli would also be disclosed by such an investigation. Nevertheless, the number of sufferers discovered would be small. Investigate as we will we cannot find cases that do not exist.

Such investigation, therefore, hardly appears to be within the scope of the antituberculosis scheme of local authorities. Work of this description, however, should prove a fruitful source of research, as systematic examination of a group of specially susceptible children as indicated could not fail to reveal factors of importance. Children would be found apparently normal at the time of investigation who would develop definite sputum-positive disease subsequently; working backwards, then, to the original findings should, in certain cases, be the means of shedding light on equivocal factors and increasing knowledge about the earliest manifestations of the disease.

Summary.

(1) 48 consecutive sputum-positive cases of tuberculosis in children have been investigated with regard to, inter alia, the previous history and mode of onset, the period of delay between onset and notification, the exact stage reached by the disease at the time of notification, age and sex.

(2) 121 consecutive sputum-positive cases of tuberculosis in children have been investigated especially to ascertain the importance or otherwise of contact with other sufferers in the household. (These cases include the previous 48 children.)

(3) The present organisation for dealing with the problems concerned has been surveyed, and modern methods in operation in some parts of America have been discussed.

Conclusions.

A. Negative Sputum Cases.—(1) The great majority of negative sputum or "A" cases of pulmonary tuberculosis in childhood are alive and well after five years. (2) These cases only exceptionally develop clinical tuberculosis in adult life.

B. Positive Sputum Cases.—(3) The positive sputum cases of the disease in childhood are very rare. (4) When tubercle bacilli appear in the sputum of a child the outlook is grave. (5) Girls are affected much more frequently than boys. Whilst the appearance of positive sputum disease in any child under 16 years of age is rare, the condition below the age of 10 is a medical curiosity. The incidence rises with advancing adolescence, the curve ascending to the young adult peak in the twenties. (6) Children living in contact with open cases of tuberculosis in the household are in greater danger of developing the disease than children in healthy homes. (7) Children show a high degree of resistance to tuberculosis, as even child contacts, though they may show "infection" by tuberculin tests, seldom become affected by the disease. (8) When symptoms become obvious the disease is usually detected quickly. (9) The disease may be present for some considerable time, occasionally in apparently robustly healthy children, before symptoms proclaim themselves. (10) Even repeated physical examinations during this latent period fail frequently to demonstrate the trouble whilst it might be yet curable. (11) Radiography should succeed in some cases where ordinary methods of examination fail, and it should be employed in all cases where the suspicion of tuberculosis has been raised, before arriving at a negative diagnosis. (12) Suspicious symptoms, such as cough or lassitude, in a contact, especially in the older girls, should be the signal for an immediate and searching investigation. (13) Intensive investigation by means of systematic skin-testing and radiography on large groups of children on the American lines cannot be advocated generally in England. In a specially selected group of contact children, however, such work would prove a valuable research.

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5. Wood, W. B: Tubercle, 1930, xi., 489.
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9. Health in High Schools, 1931. W. E. Rathbone, National Tuberculosis Association of America.
10. Philip, Robert: Brit. Med. Jour., 1931, i., 43,
11. Brit. Med. Jour. (Leading Article), 1931, i., 63.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE.

THE following appointments are notified: Surg. Lts. J. A. Browne to *Gnat*; and A. E. Flannery to *Tarantula*.

ROYAL ARMY MEDICAL CORPS.

Maj. J. A. Whitaker, Dental Surg., relinquishes his temp. commn.

H. C. M. Walton to be Lt. (on prob.) and is secd. under the provisions of Art. 213, Royal Warrant for Pay and Promotion, 1931.

ARMY RESERVE OF OFFICERS.

Lt. W. F. Roper resigns his commn. and retains the rank of Lt.

TERRITORIAL ARMY.

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RESERVE OF AIR FORCE OFFICERS.

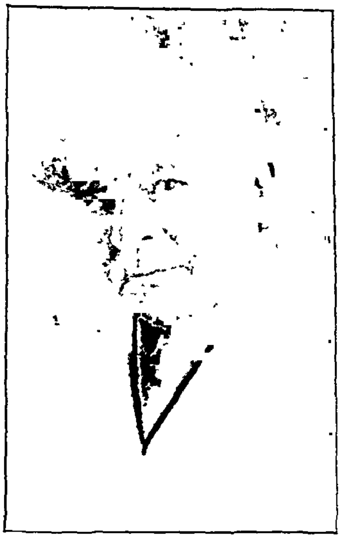
The undermentioned Flight Lts. relinquish their commissions on completion of service: B. Pollard and G. J. Griffiths.

OBITUARY

SIR WILLIAM SMITH, M.D. Aberd., D.Sc. Edin.,

PRINCIPAL OF THE ROYAL INSTITUTE OF PUBLIC HEALTH.

We regret to announce the death of Sir William Smith, principal of the Royal Institute of Public Health, which occurred on March 17th at his house in London in the eighty-third year of his age.



SIR WILLIAM SMITH.

William Robert Smith, the eldest son of Captain T. R. Smith, of the Merchant Service, was born in 1850 in circumstances which compelled him to rely mainly upon his own endeavours for making a career. At the age of 15 he began to earn his own living as an assistant to a chemist, and he so well occupied his spare time as to be able to enter the medical school at St. Bartholomew's Hospital, and later to complete his medical course at Edinburgh, where he obtained the double qualification of the Colleges in 1871. He became house surgeon at the Hants County Hospital, and while there graduated in medicine at Aberdeen, and shortly afterwards received the appointment of medical officer to the old School Board for London, this being a new post. From this time onward he devoted himself with extraordinary energy to the general cause of public health, and to him undoubtedly belongs the credit of having been the first man holding any public position to insist upon the necessity of an educational organisation, to ensure that medical men holding official positions in public health should possess a special diploma. He took an early opportunity of possessing such a diploma himself, securing the D.P.H. Camb. in 1881, about which date he entered as a student at the Middle Temple. On being called to the Bar he obtained an appointment as lecturer in forensic medicine at King's College, London, while he also was chosen as medical officer of health for Woolwich. He found time also to edit the seventh edition of Guy and Ferrier's standard text-book on forensic medicine.

In 1886 he founded the British (now Royal) Institute of Public Health, and for the following 46 years devoted his life to the progress of public health work as represented by the Institute. Seeing that from the beginning such a movement must rely upon public coöperation, he took great interest in municipal politics, was elected mayor of Holborn, and gave valuable service to that great borough out of his personal knowledge of the administration of public health, especially in relation to the welfare of children. In 1894 he presided at the Congress of Public Health in London, in which year he was first elected President of the Institute of Public Health, a position which he held for ten years. In 1910 he was elected vice-chairman of the old Metropolitan Asylums Board, of which he had been a member for a long period, and in 1918 he was Sheriff of London, receiving the honour of knighthood. In that year he stood unsuccessfully as an Independent for the Parliamentary representation of the universities of St. Andrews, Glasgow, and Aberdeen.

From early days Sir William Smith was interested in military matters, and as far back as 1887 was a member of a War Office departmental committee. In 1908, on the creation of the Territorial Force, he became a major, and during the war served as a special sanitary officer with the rank of colonel R.A.M.C.(T.). Into his military duties he threw the same enthusiasm that marked his other official and municipal work, and during all the later phases of his life his energy triumphed over the disabilities of failing health. Holding so many public posts it was inevitable that he should be the recipient of many acknowledgments of his work. He was widely recognised on the continent as an authority on public health, and was the recipient of decorations from the French, Greek, Rumanian, Belgian, and Italian Governments, while he had honorary degrees from the universities of Athens, Geneva, Padua, and Ghent.

One intimately acquainted with both his work and personality writes of Sir William Smith as follows: "William Smith set himself to create (in effect) the national statutory and official basis, facilities and organisation for the system of public health diplomas, training, and appointments which we know to-day. He succeeded. Instant upon that hard-won success there flashed upon the mind of the creative artist a vision of the immeasurable future, national and international, for preventive medicine and public health progress. And, with that vision, William Smith must clearly have seen himself as, of necessity, one of the world leaders in that progress. For England led the world in the domestic sciences. In 1886 he founded the Institute of Public Health. And through the 46 years that followed founder and Institute were one and indivisible. It is no more than the simple truth to assert that, during those years of social revolution, there has been no single episode of progress in public health work that the Institute did not itself initiate or did not actively further and support. Even the creation of the Ministry of Health was mainly due to the persistent efforts of William Smith. Of the perseverance, the mental and physical vigour, the dominating personality, the knowledge of men and matters, these and other factors that made the result possible no casual record can tell. From first to last he was a great fighter. His ideas were new, and the English fear and, therefore, hate novelty. And it was actually within the past two years that, with his advanced age, he accomplished perhaps his most remarkable achievement. Faced with the compulsory demolition of the Institute premises he found, secured, and paid for a near-by plot of freehold land, and only just failed to witness the imminent opening of the new building."

Sir William Smith was twice married. His son by the first marriage is Mr. Corbett-Smith, the well-known publicist and musician. In 1913 he married for the second time Miss Frances Wheeler, J.P., Lady of Grace of the Order of St. John of Jerusalem.

MILK GRADES.

The Milk Ordinance defines eight grades of milk, which are briefly indicated below :—

Certified milk must conform with the current requirements of the American Association of Medical Milk Commissions, and is produced under the supervision of the Medical Milk Commission of the County Medical Society, and of the State Board of Health, or of the City and County Health Officer. It is raw milk produced under stringent sanitary conditions, is sold at a high price, and forms but a very small proportion of the total milk-supply.

Grade "A" raw milk must have an average bacterial count not exceeding 50,000 per c.cm. It must be drawn from cows that have passed a veterinary examination, with tuberculin testing, be cooled within one hour after milking to 50° F. or less, and kept at that temperature until delivery, and be supplied in bottles. It must also be produced under certain hygienic conditions, which are defined in detail.

Grade "B" raw milk must have an average bacterial count not exceeding 200,000 per c.cm. ; otherwise it must conform with all the conditions that are required for grade "A" raw milk, except that the cooling temperature standard is 70° F.

Grade "C" raw milk may have an average bacterial count not exceeding 1,000,000 per c.cm. ; otherwise it must conform with the standards that apply to grade "B" raw milk.

Grade "D" raw milk must, like all milk, contain not less than 3¼ per cent. of milk fat, and 8½ per cent. of solids not fat, but otherwise it is not standardised and must be labelled "cooking only."

Grade "A" pasteurised milk is grade "A" or grade "B" raw milk that has been pasteurised, cooled, and bottled in a milk plant complying with certain hygienic conditions. Its bacterial count must not at any time between pasteurisation and delivery exceed 50,000 per c.cm.

Grade "B" pasteurised milk is grade "C" raw milk pasteurised under all the conditions that apply to grade "A" pasteurised milk.

Grade "C" pasteurised milk is pasteurised milk that does not conform with the requirements of grade "B" pasteurised milk, and it must be labelled "cooking only."

Although the Milk Ordinance provides for no less than eight grades of milk, in practice a smaller number is generally adopted. In many American cities no raw milk, except certified milk, is allowed to be supplied, and by the adoption of compulsory pasteurisation the number of grades has been reduced to three: certified milk, grade "A" pasteurised, and grade "B" pasteurised.

COMPULSORY PASTEURISATION.

The movement for compulsory pasteurisation has made great progress in America in recent years, and is still gaining ground. The movement owes much of its success to the late Mr. Nathan Straus, the well-known philanthropist, who fortunately lived to see the wide acceptance of his views on milk hygiene. Mr. Straus nearly 40 years ago established milk depôts in New York for the supply of pasteurised milk, modified for infant feeding, and was untiring in his advocacy of the compulsory pasteurisation of the general milk-supply. Pasteurisation is now compulsory in New York and many other cities in the United States.

Pasteurisation is defined in the Milk Ordinance as "the process of heating every particle of milk or milk products to a temperature of not less than 142° F., and holding at such temperature for not less than 30 minutes in a pasteurisation apparatus approved by the health officer." In practice it is necessary to make allowance for a margin of error in the thermometers used for recording the temperature of the milk in the container, and also for a deviation between the hottest and coldest particles of milk in the container during the process. A combined "tolerance" of 1½° F. is permitted, so that the recorded temperature required for pasteurisation is 143½° F. It is recommended that approval should not be given to any pasteurising plant with a combined tolerance exceeding 1½° F.

PUBLICITY FOR PASTEURISATION.

The 1931 edition of the Milk Ordinance is preceded by an account of the "Public Health Service Milk Sanitation Program," by Mr. Leslie C. Frank, the sanitary engineer in charge of the Federal *Office of Milk Investigation.* This document contains much practical guidance, based on extensive experience, for city authorities contemplating the adoption of the Ordinance. Compulsory pasteurisation is strongly recommended, and health officers are given suggestions for overcoming possible objections from the public to pasteurisation, one of which is that the process imparts an unpleasant flavour to the milk. To meet this objection, a "*guessing contest*" is suggested :—

> "For example, one of the local pasteurisation plants may furnish both raw and pasteurised milk in quart bottles to the Rotary and other civic luncheons, the bottles being marked with distinguishing marks unknown to the drinkers. Each member should be provided with six glasses, placed in a row in front of him. A small portion of pasteurised milk should be placed in three of the glasses and a small portion of raw milk in the other three in an order unknown to *anyone but the health officer.* The members should not be told how many glasses contain pasteurised milk. Then each member should be asked to tell by tasting which of the six glasses contain pasteurised milk. (It is fundamentally important that the raw milk and pasteurised milk be identically the same milk, except for the fact of pasteurisation. This condition is accomplished best by obtaining the raw milk directly from the pasteuriser just prior to the pasteurisation process, after thorough mixing, and then obtaining the pasteurised milk from the same batch of milk.)
>
> "Each guest should be provided with a small card. The glasses should be considered as being numbered from left to right, and each guest should be asked to write on the card the numbers representing the glasses containing pasteurised milk. Then someone from the speaker's table should announce the true content of each of the six glasses, and all the members who guess correctly may be awarded a prize of some sort."

After such a guessing contest has been tried upon at least 100 persons in the city, the results may, it is suggested, be published in the newspapers as evidence of the fact that proper pasteurisation does not affect the flavour of milk.

DEALING WITH DEFAULTERS.

The Milk Ordinance provides two methods for dealing with defaulting dairymen otherwise than by means of court prosecutions for failure to observe the standards of milk hygiene prescribed: one is the withdrawal of the permit, the other de-grading the milk of the defaulter. By the first method the permit may be withdrawn and the offender prosecuted if he continues to sell his milk without a permit. But this method is, in practice, applicable only in cases of serious default, for otherwise the courts are reluctant to convict, or at all events to impose an adequate penalty. A much more effective method is to de-grade the defaulter's milk and require him to affix a lower grade label to his containers. If he then persists in selling his milk under the higher grade label he can be prosecuted for false labelling, an offence which American courts view with great disfavour. In practice it is seldom necessary to prosecute in such a case, for the offender knows that he will receive short shrift when the court are satisfied that he has not been refused permission to sell his milk, but merely required to label it according to grade. He therefore seldom allows the case to go into court, but promptly complies with the requirements and gets back into his grade as soon as he can.

Advisory Committee) that was not in itself a sufficient reason for not prescribing it if, in his judgment, it was the proper form of treatment, other drugs not being equally efficient. This statement was issued "for the practitioner's future guidance," no ground for complaint being found against him. The panel committee regarded it as a "homily," and protested to the medical members of the insurance committee on the form of the wording which, whatever the strict legal position, seemed to take away from the doctor a useful argument for not prescribing a preparation when demanded by a patient who has great faith in it.

National Formulary.

There are in the National Formulary certain preparations of which the directions for use are printed with the formulæ; in the absence of any direction on the prescription, the chemist has to label the preparation according to this standard direction. If the practitioner writes directions himself, those directions take precedence over those of the standard formulary. But if he simply gives verbal instruction to the patient as to how the medicine should be used, the chemist puts on the bottle the formulary directions which may be different. Trouble is then likely to arise between doctor, chemist, and patient. The London Panel Committee, on the advice of its pharmacy subcommittee and after full discussion, decided to ask the Insurance Acts Committee to negotiate with the Ministry for the deletion from the Formulary of the printed directions.

Choice of Doctor.

The ethical subcommittee of the London Panel Committee has succeeded in persuading a hotel not to force its employees to go on the hotel doctor's panel. The hotel had issued a leaflet to its staff in he following terms:—

> Insured persons have the right of selecting their own anel doctor.
>
> It is, however, a great convenience to employees and to he company for employees to be on the hotel doctor's anel.
>
> Are you willing to transfer to this panel?
> (Write "Yes" or "No")........
> Signature......................

In reply to a request from the panel committee to leal with the matter, the Ministry stated they were not aware of any action that could usefully be taken. Eventually, however, the hotel representative asked what wording the panel committee would suggest, and the following was approved:—

> Insured persons have the right of selecting their own panel doctor. You are requested to make your selection from the doctors in the immediate neighbourhood at once.

Thus the free choice of doctor was maintained in this neighbourhood.

PARIS.

(FROM OUR OWN CORRESPONDENT.)

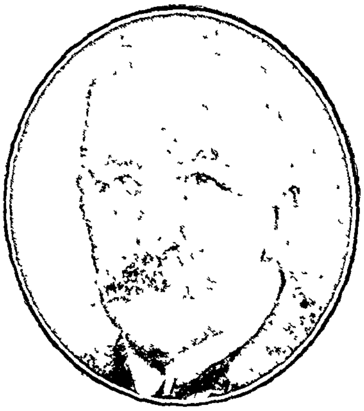
A CROSS SECTION OF A DIABETIC HOSPITAL SERVICE.

WHAT is probably a fairly characteristic sample of diabetic careers under modern hospital conditions was given by Prof. Marcel Labbé in a communication to the Academy of Medicine on Feb. 9th. His cross section dealt with the year 1930, when 136 diabetics were treated in the wards of the Pitié, and 314 in its out-patient department. The in-patients for the most part represented a more serious phase of the disease than did the out-patients; a feature of the resident treatment was education of the patient in the technique of his own treatment. Patients who refused admission to hospital were coached by a social service worker in the graduation of their diets and the daily examination of their urines for glycosuria by Gerhardt's test. They were also taught the technique of insulin injections, and given printed instructions on how to avoid diabetic coma. Contact was maintained between these patients and the hospital through their visits once or twice a month to call for their insulin. The social worker who visited patients in their homes found them occasionally on the verge of coma, and brought them back to hospital and to life. In spite of surveillance and education, many patients died simply because they did not take the necessary trouble to live, and every summer holiday, away from home and supervision, yielded a crop of disasters. Among the 136 in-patients during the year there were 17 deaths, and among the 314 out-patients 20 deaths. Pulmonary tuberculosis was responsible for 24 per cent. of the deaths; diabetic coma and Bright's disease each for 13·5 per cent.; and infections and septicæmia for 10·8 per cent. The mortality from tuberculosis might be reduced by keeping the diabetic in a separate ward to which the tuberculous are never admitted, and by artificial pneumothorax treatment which, in Prof. Labbé's opinion, provides the diabetic's *only* chance of recovery. It says much for the modern treatment of diabetes that, while in Prof. Labbé's material only 13·5 per cent. of the deaths were due to diabetic coma, this condition was responsible for 60 per cent. of the deaths of diabetics in Naunyn's time.

PERI-ARTICULAR INJECTIONS OF NOVOCAIN IN TRAUMATIC ARTHRITIS.

Some interest has been aroused by the account given in the *Presse Médicale* for Feb. 20th, by Dr. R. Leriche and Dr. R. Fontaine, of Strasbourg, of the way in which a simple diagnostic device developed into what they now consider a valuable therapeutic measure. In March, 1930, one of them was engaged on a study of the sensory nerve-supply of the joints. He found that by the injection of an anæsthetic into the ligaments and insertions of tendons about joints, it was possible to dissociate purely mechanical ailments thereof from accompanying functional disturbances. Sometimes he was able to demonstrate the existence of functional disturbances which were alone responsible for symptoms and impaired movement about a joint. While engaged on the differential diagnosis of complaints of the joints, the authors observed an unexpected therapeutic effect of their injections. In every case in which the mechanical element was trifling, and reflex disturbances dominated the clinical picture, the functional improvement following these injections lasted much longer than the actual local anæsthesia; and when these symptoms occurred, they were, as a rule, much less pronounced than before. This led to the repetition of the injections four or five times, and to the complete disappearance of all the symptoms in certain cases of sprains and traumatic arthritis. Left to themselves, such cases sometimes clear up after a long period of stiffness, but functional defects often persist. Occasionally these cases end in veritable chronic arthritis deformans although, at the outset, according to the author, a complete cure could easily have been effected by peri-articular injections of an anæsthetic, a measure within the sphere of activity of every practitioner. They believe peri-articular infiltration is more satisfactory than intra-articular injection, and that

GEORGE BROWN HILLMAN, M.B.E., L.M.S.S.A., J.P.



DR. HILLMAN.

WE regret to announce the death on March 19th of Dr. G. B. Hillman, Member of Parliament for Wakefield. He had been lying ill for some days in London with bronchitis, when death took place suddenly from heart failure. George Brown Hillman was a son of the late Rev. S. D. Hillman, of Ilkley. He was educated at Ilkley High School, going on to the Leeds School of Medicine, where he took the Hardwick prize in clinical medicine and qualified L.S.A. in 1892. Soon after qualification he held resident appointments at the Leeds Hospital for Women and Children; he then started in general practice in the Castleford district of the West Riding, with sanitary charge of that and the Whitwood urban district, and became a steadily growing influence in local medical politics. In 1915 he received a commission in the R.A.M.C., reaching the rank of major in the Malta Command, where he was in charge first of the Spinola General Hospital and later of the Hamrun Military Hospital. On returning to Wakefield he soon became chairman of the West Riding local medical and panel committee, and was increasingly occupied in public work, becoming a member of the city council in 1926 and mayor of Wakefield in 1928. For a time he was chairman of the medical propaganda subcommittee of the British Empire Cancer Campaign. He first stood for Parliament at the general election of 1923, when he contested unsuccessfully the Normanton division. At the election in October last, standing for Wakefield as Conservative, he won the seat from Mr. G. H. Sherwood, another ex-mayor of the town. In 1895 Dr. Hillman married Christina, daughter of Mr. John Henderson, of Bradford.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED MARCH 12TH, 1932.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 76 (last week 41); scarlet fever, 1610; diphtheria, 818; enteric fever, 23; pneumonia,* 1929; puerperal fever, 42; puerperal pyrexia, 119; cerebro-spinal fever, 72; acute poliomyelitis, 1; polio-encephalitis, 1; encephalitis lethargica, 11; dysentery, 17; ophthalmia neonatorum, 112. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on March 15th–16th was as follows: Small-pox 110 under treatme

week 101 and 7 respectively);

1551; enteric fever, 10; measles, 2048; whooping-cough, 400; puerperal fever, 23 (plus 9 babies); encephalitis lethargica, 226; poliomyelitis, 4; "other diseases," 196. At St. Margaret's Hospital there were 13 babies (plus 8 mothers) with ophthalmia neonatorum.

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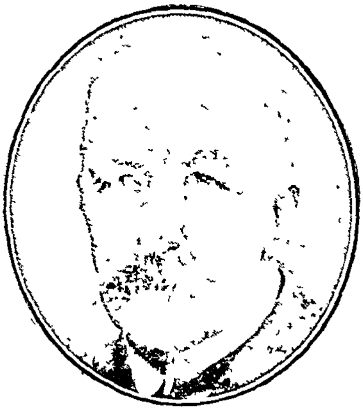
GEORGE BROWN HILLMAN, M.B.E., L.M.S.S.A., J.P.

We regret to announce the death on March 19th of Dr. G. B. Hillman, Member of Parliament for Wakefield. He had been lying ill for some days in London with bronchitis, when death took place suddenly from heart failure. George Brown Hillman was a son of the late Rev. S. D. Hillman, of Ilkley. He was educated at Ilkley High School, going on to the Leeds School of Medicine, where he took the Hardwick prize in clinical medicine and qualified L.S.A. in 1892. Soon after qualification he held resident appointments at the Leeds Hospital for Women and Children; he then started in general practice in the Castleford district of the West Riding, with sanitary charge of that and the Whitwood urban district, and became a steadily growing influence in local medical politics. In 1915 he received a commission in the R.A.M.C., reaching the rank of major in the Malta Command, where he was in charge first of the Spinola General Hospital and later of the Hamrun Military Hospital. On returning to Wakefield he soon became chairman of the West Riding local medical and panel committee, and was increasingly occupied in public work, becoming a member of the city council in 1926 and mayor of Wakefield in 1928. For a time he was chairman of the medical propaganda subcommittee of the British Empire Cancer Campaign. He first stood for Parliament at the general election of 1923, when he contested unsuccessfully the Normanton division. At the election in October last, standing for Wakefield as Conservative, he won the seat from Mr. G. H. Sherwood, another ex-mayor of the town. In 1895 Dr. Hillman married Christina, daughter of Mr. John Henderson, of Bradford.



DR. HILLMAN.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED MARCH 12TH, 1932.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 76 (last week 41); scarlet fever, 1610; diphtheria, 818; enteric fever, 23; pneumonia,* 1929; puerperal fever, 42; puerperal pyrexia, 119; cerebro-spinal fever, 72; acute poliomyelitis, 1; polio-encephalitis, 1; encephalitis lethargica, 11; dysentery, 17; ophthalmia neonatorum, 112. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on March 15th–16th was as follows: Small-pox 110 under treatment, 6 under observation (last week 101 and 7 respectively); scarlet fever, 1453; diphtheria, 1551; enteric fever, 10; measles, 2048; whooping-cough, 400; puerperal fever, 23 (plus 9 babies); encephalitis lethargica, 226; poliomyelitis, 4; "other diseases," 196. At St. Margaret's Hospital there were 13 babies (plus 8 mothers) with ophthalmia neonatorum.

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purely of a supervisory character.—Sir BOLTON EYRES-MONSELL replied: There are no dental officers of the rank of surgeon-captain employed in the Navy at a remuneration of £3 9s. a day. One surgeon-captain (D) only is allowed in the establishment of dental officers, this officer being employed at the Admiralty on the staff of the Medical Director-General of the Navy, to whom he is responsible for the entire administration of the naval dental service. His duties necessarily include those of a supervisory character. His pay is at the current rate of £3 a day, plus the usual allowances.

THURSDAY, MARCH 17TH.

Women Workers in Factories.

Mr. THOMAS WILLIAMS asked the Home Secretary the number of women workers in the factories of England and Wales; the number of factories that might be inspected by his department; and the number of women inspectors available for inspection duties.—Sir HERBERT SAMUEL replied: Returns show that in 1930 there were 1,806,850 women and girls employed in factories: the figure for 1931 is not yet available. The number of registered factories *at the end of 1931 was 155,354.* There are at present 56 women inspectors in the divisional and district staffs. It would, of course, not be practicable to lay down any rule that factories where women only are employed should be inspected only by women inspectors.

Attacks on Women and Girls.

Mr. LEWIS asked the Home Secretary whether since the introduction of women police the number of cases of attacks on women and girls had a tendency to increase or to decrease.—Sir H. SAMUEL replied: Since women police were first employed, during the war, the reported numbers of some kinds of attacks on women and girls have decreased, *while others have increased. Such fluctuations are due to* various factors, and I am unable to suggest any direct relation between them and the employment of women police.

Medical Staff of the Ministry of Health.

Mr. J. A. L. DUNCAN asked the Minister of Health the number of salaried persons holding medical qualifications on the headquarters staffs of the Ministry of Health in March, 1925, and March, 1932.—Mr. ERNEST BROWN (Parliamentary Secretary to the Ministry of Health) replied: The numbers are 56 and 52 respectively.

National Health Insurance.

Mr. RHYS DAVIES *asked the Minister of Health whether* he proposed to introduce legislation to deal with the problems connected with national health insurance; and, if so, when.—Mr. ERNEST BROWN replied: The problems to which the hon. Member refers are receiving my right hon. friend's most careful consideration as a matter of urgency but he is not yet in a position to make any statement as to the introduction of legislation to deal with them.

Captain STRICKLAND asked the Minister of Health the reason for the present disadvantageous position of deposit contributors compared with contributors through an approved society under the National Health Insurance Acts; and whether he would consider an early amendment granting them equal privileges.—Mr. ERNEST BROWN replied: The National Health Insurance scheme has from the first been based on the provision of benefits to insured persons through approved societies, and the full advantages of the scheme can only be obtained through membership of a society. My right hon. friend sees no reason for amending the Act in this respect. The Act already contains special provision to meet the case of insured persons who, by reason of ill-health, are unable to secure admission to an approved society.

Training of Midwives.

Lieut.-Colonel FREMANTLE asked the Minister of Health the total amount of grants disbursed by the Ministry during the year ended April 5th, 1931, towards the training of midwives; whether the grants were paid direct to training schools; and, if so, the number of pupils trained under such grants and the number proposing to practise as midwives and health visitors respectively.—Mr. ERNEST BROWN replied: The total amount of the grants disbursed by the Ministry during the year ended April 5th, 1931, towards the training of midwives was £21,363. These grants were paid direct to the training schools. The number of pupils in respect of whom grants were paid was 752, of whom 717 proposed to practise as midwives, and 35 as health visitors.

Lieut.-Colonel FREMANTLE asked the Minister of Health whether any regulations regarding the payment of grants for the training of midwives had been made under the Local Government Act, 1929.—Mr. ERNEST BROWN replied: No, Sir. The conditions governing the payment of grants for this purpose were settled and published in 1925, and were not affected by the passing of the Local Government Act of 1929.

Preservatives in Foreign Bacon.

Mr. THORNE asked the Minister of Health if he was aware that some bacon imported from America was cured in a solution of borax for preservation in transit; and what steps were taken by his department to ensure that bacon so cured was not harmful to the health of the consumer.—Mr. ERNEST BROWN *replied: The importation of* bacon cured with borax is prohibited under the Preservatives Regulations. My right hon. friend is not aware of any recent contravention of the regulations in this respect, but if the hon. Member will give him any particulars in his possession inquiries will be made.

MONDAY, MARCH 21ST.

Thames Floods Prevention.

Mr. MOREING asked the Minister of Health whether a decision had been arrived at with regard to the resumption of the work of the Departmental Committee on Thames Floods Prevention; whether it was expected that the committee would resume its sittings; and whether he would urge the committee to expedite its deliberations and issue a report at an early date.—Sir E. HILTON YOUNG replied: The question of the resumption of the sittings of this Departmental Committee is under consideration, and I *cannot at the moment add anything to the reply given to* my hon. friend on March 3rd.

Heavy Traffic in Medical Areas.

Sir JAMES REYNOLDS asked the Minister of Transport if he was aware of the annoyance caused by the use for heavy traffic of streets devoted primarily to the medical profession; and if he would consider taking steps to ensure that such streets be kept free of such traffic for the benefit of patients where there were alternative routes conveniently available.—Mr. PYBUS replied: I am afraid it would be impracticable to impose restrictions such as my hon. and gallant friend suggests.

Public Health Services in India.

Dr. MORRIS-JONES asked the Secretary for India whether any decision had been arrived at regarding the proposal to abolish the post of director of public health in the United Provinces and to amalgamate the public health department with the medical department under the inspector-general of civil hospitals.

Lieut.-Col. FREMANTLE asked the Secretary for India whether any decision had been made regarding the proposal to abolish the post of director of public health in the United Provinces and to amalgamate the public health department with the medical department under the inspector-general of civil hospitals; whether he would state the reasons for and against the proposal; and in what way it was proposed to safeguard the health of the people not in hospital.—Sir S. HOARE replied: I have not heard of any such proposal as regards the United Provinces. Perhaps my hon. friends are referring to the Central Provinces where a proposal to combine temporarily the posts of director of public health and the inspector-general of civil hospitals is under consideration as a measure of economy.

Duties of Medical Staff of Ministry of Health.

Sir CHARLES CAYZER asked the Minister of Health whether any of the whole-time members of his medical staff performed duties or held appointments other than such as were connected officially with his department for which they received emoluments not provided by the State.—Sir E. HILTON YOUNG replied: The answer is in the affirmative. I should, however, make it clear that the performance of any such duties or the holding of any such appointments (which consist of the delivering of occasional lectures or acting temporarily as examiners) are only allowable where they do not interfere with the regular duties of the position of an officer as a public servant, or with the public interest.

The Silicosis Scheme.

Mr. NEIL MACLEAN asked the Home Secretary what was the total sum paid out under the Various Industries (Silicosis) Scheme since the inception of the scheme for England and Wales and for Scotland, respectively.—Sir H. SAMUEL replied: I regret that separate figures as to the compensation paid under the Various Industries and Metal Grinding Industries Schemes, which are identical except as regards the processes to which they apply, are not available, but the total compensation paid under these two schemes during 1929 and 1930 was £46,783. I have no information as to the proportion paid in England, Wales, and Scotland respectively. The figures for 1931 are not yet available.

Mr. NEIL MACLEAN asked the Home Secretary if any steps were being taken by the Home Office to have plant installed y the employers to prevent silicosis.—Sir H. SAMUEL eplied: Much has been and is being done in this irection. Regulations to prevent silicosis have been ade under the Factory and Workshop Act, 1901, for number of industries, including the manufacture of ilica bricks, the manufacture of cutlery and edge tools, and e grinding of metals and cleaning of castings, and a upplementary code of regulations for the pottery industry has recently been agreed with the industry, and will be brought into force very shortly. All these regulations include requirements involving the installation of plant to prevent inhalation of dust. Further, it is the general practice of the inspectors under Section 74 of the Act to require the provision of exhaust ventilation in any case where the workers are exposed to this risk. The prevention of silicosis in mines and quarries is a matter for the Mines Department.

MEDICAL NEWS

niversity of Oxford.

Wilbert Hurst Brown, B.M., has been elected to the adcliffe travelling fellowship for 1932.

niversity of London.

At a meeting of the Senate, held on March 16th, Prof. arl Prausnitz was appointed Heath Clark lecturer for the ar 1932; Sir John Rose Bradford, F.R.S., has been elected vice-chairman of the University College Committee r the year 1932–33.

oyal College of Physicians of London.

At a meeting of the College on March 21st Lord Dawson Penn was re-elected President.

Diplomas in ophthalmic medicine and surgery were anted, jointly with the Royal College of Surgeons, to the llowing:—

G. P. Barua, W. M. Box, T. N. D'Arcy, A. A. Al Rahim ahmy, Kamala Ghosh, Andrew Grant, Y. M. Khan, Surendra th Mitter, . M. Moffatt, G. E. Plowright, Alison L. Taylor, d E. H. Walker.

The College will be closed from Friday, March 25th, till uesday, March 29th, both days inclusive.

niversity of Liverpool.

At recent examinations the following candidates were ccessful:—

D.M.R.E.

J. P. Grieve, W. Griffiths, R. B. Guyer, P. T. K. Nayar, . L. Rubin, J. S. Tomb, and Sylvia Wigoder.

D.T.M.

B. N. Bhandari, P. Dass, J. A. Doherty, and R. L. Portway.

D.T.H.

G. P. F. Bowers, A. Cathcart, T. K. Kurivila, I. C. Middleton, d H. J. H. Spreadbury.

D.P.H.

Part I.—F. J. H. Crawford, Rita Henry, E. D. Irvine, . W. Paton, M. Solomon, and Honora J. Twomey.

niversity of Dublin.

At recent examinations in the School of Physic, Trinity ollege, the following candidates were successful:—

FINAL EXAMINATION FOR M.B., B.CH., AND B.A.O.

Part I.—Materia Medica and Therapeutics; Medical Juris-rudence and Hygiene; Pathology and Bacteriology: *D. M. itchell, *R. B. Hunter, Mary E. Mansfield, George Hannigan, . J. Roberts, J. S. Ruddell, Marion A. G. Kennedy, G. S. S. arty, R. G. B. Wigoder, E. S. A. Ashe, W. P. Griffin, and . N. Taylor.

Part II.—Medicine: D. C. Evans, J. G. Wilson, H. J. arland, H. B. Wright, and M. A. Shapiro. *Surgery:* D. B. radshaw, H. S. Mason, L. L. Nel, A. J. O'Connor, H. J. Garland, athleen R. Byrne, T. J. O'Sullivan, Joseph Elliman, P. H. eacock, E. S. Samuels, M. A. Shapiro, and Edward Morrison. *idwifery:* *J. N. Concannon, *S. N. Varian, H. B. Wright, J. A. Mallie, W. M. E. Anderson, D. T. Annesley, W. T. Bermingham, and Elizabeth G. Graham.

* Passed on high marks.

Instruction for D.P.H.

A three-months' course of lectures and demonstrations on Clinical Practice and in Hospital Administration will be given at the Brook Hospital, Shooter's Hill, Woolwich, London, S.E.18, by Dr. J. B. Byles, the medical superintendent, on Tuesdays and Fridays at 3 P.M., and alternate Saturdays at 11 A.M. from Tuesday, April 5th. Further particulars may be had from the Medical Officer of Health, London County Council, Public Health Department (Special Hospitals), Victoria Embankment, E.C.4.

Royal Sanitary Institute.

A sessional meeting will be held at York, in conjunction with the Yorkshire branch of the Society of Medical Officers of Health and the North-Eastern Centre of the Sanitary Inspectors Association, on April 1st and 2nd, 1932, when papers will be read on Medical and Social Conditions in Soviet Russia, by Dr. W. W. A. Kelly; on York's Experience with Tuberculous Milk, by Mr. Frank Fishburn; and on Non-pulmonary Tuberculosis in York, by Dr. P. R. McNaught.

Post-graduate Work at Dundee.

A course of lectures will be given at Dundee Royal Infirmary at 3.15 P.M. on Thursdays from April 7th to May 26th. The first, on Gastric and Duodenal Ulceration, will be given by Dr. W. E. Foggie and Mr. John Anderson.

London Hospital Medical College.

The subject chosen for the Hutchinson triennial prize dissertation for 1935 is Septic Infections of the Hand, with special regard to the End Result. Particulars will be found in our advertisement columns.

Elizabeth Garrett Anderson Hospital

Last year there were 2893 in-patients, an increase of 95, and 7492 out-patients. Although there was a deficit of £1564, the income increased by £1166 and the expenditure fell by £514.

Higgins Memorial Sterilising Room at Louth.

As a memorial to the late Dr. W. R. Higgins, a new sterilising room has been provided in the Louth District Hospital. Dr. Higgins, who died on August 22nd, 1930, was for 24 years honorary medical officer of the institution and a very popular surgeon in the town. The sterilising room, which cost about £250, has been provided by public subscription, and the equipment in it is the gift of the management committee of the hospital. The opening ceremony was performed by Major E. F. Finch, F.R.C.S., who said that in providing this addition to the hospital they were fulfilling one of the greatest desires of Dr. Higgins's heart. A vote of thanks to Major Finch was proposed by Dr. Laughton Smith and seconded by Colonel L. P. Stephen, honorary surgeon to the hospital.

Medical Superintendents' Society.

The annual dinner of the Society was held on March 19th at the Langham Hotel, London. Some 75 members and guests were present, the President of the Society, Dr. J. Basil Cook, being in the chair. The health of the Society was proposed by Dr. H. L. Eason, and responded to by Dr. Cook, who outlined the part the Society had taken during the past 45 years in the evolution of the municipal hospitals, and urged the importance of making their vast storehouses of clinical material available for medical students. The health of the visitors was proposed by Dr. Clifford Ellingworth and responded to by Dr. F. R. Seymour. Amongst the guests were Prof. W. W. Jameson, Dr. J. Tate, Dr. Allen Daley, Dr. Letitia Fairfield, Dr. James Neal, and Dr. J. W. Bell.

Irish Medical Schools and Graduates Association.

The St. Patrick's Day dinner of the Association was held on March 17th at the Piccadilly Hotel, London, Dr. Howard Humphris presiding over a gathering of the members and their friends. The feature of the evening was the presentation of the Arnott Memorial Medal of the Association to Sir William Taylor, the well-known Dublin surgeon, who is understood to have been largely responsible for the movement popularly known as the "Irish Sweeps," by which the hospitals of his country have so largely benefited. Mr. J. F. Peart delivered an eloquent justification of the selection of Sir William Taylor as recipient of the medal, touching briefly upon the "Sweeps," while pointing out that the Association was honouring one who had been president of the Royal College of Surgeons in Ireland, was consulting surgeon to several large Dublin Hospitals, and a pioneer in gastric surgery. Sir William Taylor, in a brief reply, pointed out that the distribution of the prizes had brought happiness to a great many, while there could be no doubt of the enormous importance to the medical charities of the large sums of money obtained. The toast of "the Guests" was also left in the hands of Mr. Peart, who coupled with it the name of the Envoy Extraordinary and Minister Plenipotentiary for Egypt. His Excellency briefly replied, when the toast of prosperity to the Association was proposed by Mr. Patrick J. H. Hannon, M.P., and replied to by Dr. Humphris. A short musical programme was provided, which consisted in the singing of appropriate songs by Miss Wynne Ajello and Mr. Dennis O'Neil.

but important thesis, should direct our attention to the rôle of diet in the production of urinary calculi.

Bed-wetting by children in institutions can be eliminated by limiting fluid intake immediately before bedtime, and giving extra blankets in cold weather. It can be enhanced by allowing the children to sleep on a cold mackintosh covered by a single sheet. the cruel routine of most hospitals in the country to-day.

THE RÔLE OF INFECTIONS.

Infections of all kinds play their part in the beginning of urinary disease, and a free fluid intake of milk, water, and salines should therefore be tried, with alkalis, by all who treat febrile conditions.

Less appreciated is the part played by drastic purgation. Recently a patient was sent to hospital as a case of acute appendicitis, and on inquiry she confessed to taking half a bottle of cascara and several other purgatives. Intestinal colic had followed, with a bacilluria so brisk that the kidneys bled profusely. Under alkalis and rest the appendicitis did not mature, though many an attack of appendicitis has been caused by the homely over-dosage of a purgative. Transient albuminuria, bacilluria, and hæmaturia are so often present in appendicitis that there is sometimes danger of delay in removing this dangerous organ. The chances of operating upon a normal appendix and leaving a gangrenous kidney are so remote that the description of such an accident might well be left to urological journals.

In all cases of frequency with temperature and the associated symptoms the diagnosis may be one of pyelitis, but it is our duty to ascertain whether the infection is primarily renal and hæmatogenous—a descending infection—or whether the infection is reaching the kidneys along the lumen of the ureter from the bladder: the ascending pyelonephritis or surgical kidney of former days. The hæmatogenous origin of renal infections has been over-written, but more and more evidence is accumulating in favour of equal acceptance of the ascending and descending origins. Cunningham and Graves[1] have demonstrated the ease with which regurgitation occurs from the bladder to the kidney in the anæsthetised animal, and quote Kretschmer, who in 1916 found regurgitation in three out of ten children under ether anæsthesia and considered straining a factor. To-day we find the radiologists pressing on the bladder in order to obtain a better renal picture in intravenous pyelography—so much for the efficacy of the lower end of the ureter as a sphincter! If the unilateral nature of pyelitis has been exaggerated, so also has the bilateral nature of ascending infections. Unilateral pyelitis may be secondary to cystitis—most often on the right side.

> A man, catheterised three days previously for vesical congestion, suddenly developed pain and a swelling in the right loin so large that I thought an operation necessary, but Mr. Thomas in consultation wisely remarked: "The kidney is not an appendix; it will stand a lot of tension. Wait a few days and see what happens." I did, and after about a week the swelling subsided, never to recur during the remaining four years of the patient's life.

In primary renal cases, often with recognisable foci of infection, alkalis produce dramatic cures. Carbonate of soda is again displacing citrates, which are often nauseating in large quantities but are more palatable when prescribed as an effervescing tablet. Their administration should be continued for 14 days, after which sodium acid phosphate is indicated. Or, of course, the latest urinary antiseptic may be given, a careful watch being kept for any recurrence of scalding or frequency. Mercurial compounds should be avoided.

VALUE OF INSTRUMENTATION.

Many cases become chronic and run alarming temperatures for five weeks or more. The patient, desperately ill and wasted to a shadow, is tested for typhoid and tuberculosis with negative results. Vaccines are prepared and a result is sometimes obtained, usually about the time the patient would normally be improving if left alone. We have all experienced these desperate cases. Some have yielded to catheter drainage, others are cured the moment they are cystoscoped, and so I was led to search my records for a cause of these unexpected and dramatic cures. My first experience really started my interest in dysuria.

> In 1911 a woman presented herself with pain and frequency of months' standing, and by means of cystoscopy a solitary ulcer of the bladder (Hunner's ulcer) was diagnosed by Mr. R. A. Bickersteth. I was instructed to wash out the bladder next day with silver nitrate. I did this once, but caused so much pain that I had to desist. Next day she said she was better, and I left well alone. Two years later I heard that she was quite well and had had no recurrence of symptoms. How one irrigation of silver nitrate could cure an ulcer puzzled me; it has never done so outside urinary surgery.

Another case was one sent by Dr. Henry Cohen:—

> The patient complained of long and tiresome dysuria; alkalis and vaccines had been useless, and a previous cystoscopy had been done. I reported the usual blurred mucosa, adherent flakes of pus, and œdematous ureteric orifices, with apologies for paucity of treatment. Imagine my surprise when the patient reported improvement a month later! The only difference in the treatment had been that I used the large operating cystoscope, while my predecessor had only used the small inspection instrument.

The truth was revealed: these cases were due to spasm of the neck of the bladder, and a big bougie would cure them; it has cured many since.

> I was soon convinced by the arrival in the private ward of an anæmic and wasted lady with dysuria, who had consumed quarts of barley water and had had intensive alkalis and a vaccine. The pathological report of her turbid urine ran as follows: "The deposit shows a heavy deposit of pus cells and a few coliform bacilli. No tubercle bacilli present. Cultures show a free growth of streptococci. No *B. coli* grown after three days' incubation." Cystoscopy showed the usual appearances described above. Within three days the urine was clear, and she had remained well for four years.

The mechanical treatment of vesical and urethral spasm is the keynote in therapy. The dramatic cures obtained then fall into line with the cure of constipation after passage of the sigmoidoscope or by rectal bougies, and of cardiospasm by similar means. Treatment should therefore be directed to the prevention and cure of local spasm.

In the acute pyelitis with enlargement of the kidney so common in association with pregnancy, the indwelling ureteric catheter should be tried after simple measures have failed. If the catheter does not bring about improvement and operation is necessary, the renal pelvis should be approached through the renal substance without attempting to bring the kidney to the surface. Nephrectomy is rarely indicated.

Cases of pyelitis of vesical origin may be recognised by the history of neglect, absence of marked frequency, lower abdominal pain, and phosphaturia. The urine is neutral or alkaline, with the usual cloud of organisms. A strong smell is noticed by the patient or relatives, and is due to stagnation of urine.

TWO-STAGE MICTURITION.

The diagnosis can very often be established without the catheter or cystoscope, and cure can be obtained and recurrence prevented simply by two-stage micturition. Ask the patient to pass urine without straining, wait five minutes, and then ask him to try again; anything from one-half to several ounces is often obtained, *to the surprise of all concerned.* The residual urine so obtained is the origin of the chronicity of many urinary cases, the stale urine infecting the oncoming urine from the kidney and so creating a vicious circle. I owe this valuable procedure to Prof. Andrew Fullerton, and have found it of extreme value in early cases of enlarged prostate. We are *taught that the* prostate should be removed hen there is 2 oz. of residual urine, and almost the same line we read that a catheter should be oided lest infection be introduced. This para- xical situation is solved by two-stage micturition, peated every three hours during the day without raining; with no fluid intake after 8 P.M. Its nployment by those in charge of antenatal clinics ould diminish the urinary complications in preg- ncy, and it would make unnecessary the cathe- risation of something like 12 per cent. of hospital tients.[2]

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[1] Cunningham, J. H., and Graves, R. C.: Surg., Gyn., and Obst., 1924, xxxix., 39.

In well-established cases of atonic bladder with veral ounces of residual urine, the important object avoiding overload and providing rest for the over- retched musculature can be attained by getting the tient to pass water by the two-stage method every ro hours, day and night. Benefit has usually llowed in three days, the bougie also being employed necessary. Two and a half hours is allowed to apse between micturition: after three days the riod is increased to three hours, and finally the tient is allowed to rest six hours at night. On per this looks a formidable procedure, but the scipline obtained is of value in the prevention of currence. These patients must always pass water two stages and at three-hourly intervals if they re to remain well and escape uræmia at 55.

Severe cases of atony may require six-hourly theterisation for the first few days. On occasion n indwelling catheter or suprapubic drainage has pplied the necessary bladder rest which, with bolition of sphincter spasm, spells cure.

MECHANICAL DISTENSION.

In late cases of "irritable bladder" and chronic stitis without retention, to the spasm of the internal phincter is added spasm of the whole bladder, and eatment has therefore to be directed to the abolition these conditions by the big bougie and by gradual echanical distension of the bladder itself. Daily y catheter and funnel a lotion is introduced into the adder and retained for ten minutes. I start with in 10,000 silver nitrate—that is, gr. 1 tablet of lver nitrate to one pint of distilled water, doubling e dose daily until stinging is experienced, then ontinuing with a lesser strength, normal saline being ept at hand to allay any pain produced by the lotion. ny bland lotion will do—it is the quantity intro- uced and not the antiseptic that matters. On the rst day pain may be experienced with half an ounce nd later with one ounce, and so on until at the end a fortnight four ounces are held, and then the ystitic patient, no longer losing her sleep, becomes nthusiastic. We are then ready to institute some odification of the drill for atonic bladder with the wo-stage method of micturition. I make no mention f bladder washes: it is bladder distension that ounts. Just as in orthopædic surgery manipulation ay start joint movement, so the amount of distension our ounces) necessary for cystoscopy will give the ecessary start to recovery. Over-distension, like ver-manipulation, brings disaster.

After the daily distension with lotion of increasing quantity, a straight penile or small Hegar bougie introduced to abolish spasm of the internal sphincter. vesical spasm is intense, pain may be allayed by aving one ounce of 5 per cent. old oil of cajaput in ive oil in the bladder. Gomenol or 10 per cent. mulsion of iodoform in tragacanth may be useful ternatives.

DIVORCE REFORM.

THE writer of a recent pamphlet on divorce reform suggests that the only way to compel immediate amendment of the law is for the medical profession to bring in a Bill of its own, "based solely on the grounds of the health and welfare of the nation, and avoiding all religious or controversial matters." The author, whose pseudonym indicates acquaintance with the legal side of matrimonial causes, paints a gloomy picture of the perjury, collusion, and connivance which, as he says, disgrace our divorce procedure. Here in brief are his proposed reforms. The following to be grounds for divorce—adultery, unnatural offences, non-consummation of marriage, chronic alcoholism, lunacy, syphilis, condemnation to penal servitude, and, finally, incompatibility of temperament. This last ground is to be discretionary, the judge to see the parties. Physical and moral cruelty would be included, also desertion, neglect of home and family, and dissolute living; where lunacy or disease is alleged, medical assessors to sit with the judge. The divorce, when granted, should be absolute, with no six months' delay; the office of King's Proctor should be abolished; the petitioner's adultery should be no bar to divorce; no damages should be awarded unless there are children, the damages to be paid into court and settled by the court on the children. The proceedings should be private and people of moderate means should be able to obtain a divorce in a county court for £30.

"The medical profession," writes the author, "to a man are in favour of reform, particularly on the ground of insanity." It is a cheery optimism which would suppose that the profession would be unanimous upon the contents of the proposed Bill or that "all religious or controversial matters" could be avoided.

MEDICAL NOTES FROM SPAIN.

A CORRESPONDENT in Madrid comments on some matters of interest to medical readers in present-day Spain.

A MUTUAL INSURANCE SCHEME.

Under the name "Previsión Médica Nacional" the medical profession in Spain, represented by various colleges which exist for purposes of medical defence, have elaborated a scheme of mutual assurance for the profession which it is hoped to bring into being before long. The aim is apparently to make it universal and obligatory, but there is no mention of any State supervision, though it is suggested that all doctors should join on leaving the universities after qualification. Its present activities are limited to two sections, health and life insurance, with four groups in each, differing only in the amount of their contributions and the benefits they may consequently expect. Everyone would have to join group 1 (the lowest) of the health section, and if he married the same in the life section. There will also be a benevolent fund taking 10 per cent. of the surplus funds and contributed to by the wealthier members of the profession which will deal with cases not otherwise eligible for benefit. The whole scheme is based on the practice of recognised insurance companies, but owing to the poverty of the majority of doctors in Spain the initial contributions and benefits are fixed very low.

INSPECTION OF PHARMACOBIOLOGICAL PRODUCTS.

Acting on a proposal of the Institute of Pharmacobiology, the Government has issued an order directing that all imported products in certain classes shall be liable to inspection by that body before being offered for sale. A very wide range of substances is included in the order, all vaccines, serums, and glandular preparations besides many drugs such as arsenobenzol and the like, ergot, oil of male fern and digitalis derivatives. Samples will be examined to ensure their purity and uniformity of composition before being admitted for sale in the country.

NAVAL SANITARY BOARD.

The reorganisation of the medical department of the Navy is being undertaken by the Minister of Marine and orders issued for the inspection of all matters of health and sanitation, whether as regards the personnel or the ships and naval buildings ashore. The instructions are under 12 heads, and include such matters as the inspection of hospital and hospital ships, the provision of a [illegible] upply ashore and afloat, and the establishment of venereal clinics.

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[2] Mills, R. G.: Ann. Surg., 1924, lxxix., 813.

THE DIET OF GERSON.

This diet, the advocacy of which on commercial lines has caused it to be regarded with suspicion by the medical profession in Spain, has nevertheless been tried by many, on account of the results obtained by Sauerbruch and Hermannsdorfer. Good results have been observed in pulmonary tuberculosis, but a tendency was noticed to subsequent relapses (*Nóvoa Santos, Carrasco Martinez*). The best effects were seen by the dermatologists in lupus and especially in lupus of the mucous surfaces. Bejarano, Covisa, Fernandez de la Portilla, Saínz de Aja have all written to this effect. Better results are obtained in children than in adults and the most striking in the case of endonasal lupus. The diet is modified by the substitution of similar Spanish foodstuff for those prescribed and fortified with vitamin producing elements such as fruit juices and cod-liver oil. Fernandez de la Portilla narrates a case of a woman who after 20 years' treatment for tuberculous manifestations in the larynx, ear, and nose, which always relapsed, has remained free for six and a half months without any other treatment than the diet.

The Second Congress of Oto-Rhino-Laryngology will open in Madrid on Sept. 27th. The subjects chosen for discussion are oto-sclerosis, ozæna, and scleroma, and the three presidents of sections will be Duel (New York), Costiniu (Bucharest), and Belinoff (Sofia). Prof. A. G. Tapia is the president of the organising committee in Madrid.

Appointments

Hull Royal Infirmary: CORBETT, C. H., M.D. Edin., F.R.C.S.E., Hon. Surgeon; PATRICK, A., M.B. Edin., F.R.C.S.E., Hon. Assistant Surgeon.

Certifying Surgeons under the Factory and Workshop Acts: BROADHURST, H. C., M.B., B.S. Durh. (Modbury, Devon); LEIGH, H. V., M.D., B.S. Durh. (Bridgend, Glamorgan); and MERYON, C. E., M.B., Ch.B. Edin. (Alresford).

Vacancies

For further information refer to the advertisement columns.

Altrincham General Hospital.—Jun. H.S. At rate of £120.

Blackburn, Royal Infirmary.—Fourth H.S. £150.

Bootle General Hospital, Derby-road, Bootle, near Liverpool.—Hon. [illegible]

[illegible] *Hospital.*—Jun. H.S. £150.

[illegible] *atorium and Infectious Diseases* [illegible]. At rate of £150.

[illegible] *ary.*—Jun. H.S. £150.

[illegible] *pital for Limbless and Crippled.*— [illegible] on. 4 gns. a week.

[illegible] and 2 H.S.'s to Spec. Depts. Res. Registrar. £100.

[illegible] *odge, 1, Canonbury-place, Islington, N.*—Asst. Psychiatrist. £500.

City of London Hospital for Diseases of the Heart and Lungs, Victoria Park, E.—H.P. At rate of £100.

Colchester, Essex County Hospital.—H.S. £175.

Dover, Royal Victoria Hospital.—Res. M.O. £180.

Edinburgh Royal Hospital for Mental and Nervous Disorders.—Asst. Physician. £300.

Evelina Hospital for Children, Southwark, S.E.—H.S. At rate of £120.

Exeter, Royal Devon and Exeter Hospital.—H.S. to Spec. Depts. At rate of £150.

Freemasons Hospital and Nursing Home, 237, Fulham-road, Chelsea, S.W.—Surgeon Dentist.

Hospital for Sick Children, Great Ormond-street, W.C.—H.P. and H.S. Each at rate of £100.

Hospital of St. John and St. Elizabeth, 60, Grove End-road, N.W. Res. H.S. At rate of £75.

Ilford, King George Hospital.—Cas. H.S. At rate of £100.

Ipswich, East Suffolk and Ipswich Hospital.—H.S. and H.P. Each £120.

Johannesburg Hospital, South Africa.—Radiologist. £1500.

Lancaster R [illegible] and Jun. Res. H.S.'s. £175 and £1 [illegible]

Leamington [illegible] *l Hospital.*—Res. H.S. £165.

Liverpool, [illegible] *Hope-street.*—Res. M.O. At rate of £100.

L.C.C.—Res. Asst. M.O.'s for Various Institutions. Each £250. Also Res. Asst. M.O. for Hammersmith Hospital, [illegible] 0. Also Visiting M.O. for Edmont [illegible] £200.

Lond [illegible] *College, E.*—Hutchinson Trienn [illegible] Prize, 1933.

London Lock Hospital, 91, Dean-street, W.—H.S. for Male L [illegible] Hospital. At rate of £175.

Maidstone, Kent County Ophthalmic and Aural Hospital.—H [illegible] to Ear, Nose, and Throat Dept. At rate of £200.

Manchester, City.—Asst. Tuber. O. £650.

Manchester, Royal Children's Hospital, Pendlebury.—Res. M [illegible] At rate of £125.

[illegible] *Sanatorium.*—Asst. M.O. £350.

[illegible] *Kingsland-road, E.*—Sen. and J [illegible] Also 2 Cas. O.'s. Each at rate of £1 [illegible]

[illegible] *Greenwich-road, S.E.*—Hon. Asst. Su [illegible] to the Genito-Urinary Dept.

National Temperance Hospital, Hampstead-road, N.W.—Sur [illegible] Reg. 40 gns.

Northampton General Hospital.—H.S. £150.

Paddington Green Children's Hospital, W.—H.P. and H [illegible] Each at rate of £150.

Prison Medical Service.—M.O. Class II. £350.

Queen's Institute of District Nursing, 58, Victoria-street, S.W. [illegible] Gen. Supt.

Rochdale Infirmary and Dispensary.—Jun. H.S. £200.

Royal [illegible] *W.C.*—Res. Cas. O £15 [illegible]

Royal [illegible] cies.

St. Hel [illegible]

Samar [illegible] *Marylebone-road, N.W.*

[illegible] *for Women.*—Hon. General Phys. [illegible] —H.S. Also Res. Anæsthetist. Ea [illegible]

Southend-on-Sea, New General Hospital.—Hon. Surg. Phys. [illegible] Also Pathologist. £500. Radiologist £500. R.M.O. and Pharmacist. £350.

Western Ophthalmic Hospital, Marylebone-road, N.W. Res. and Jun. Non-Res. H.S. At rate of £150 and [illegible] respectively.

West London Hospital, Hammersmith-road, W.—Hon. Radiologist.

Winchester, Royal Hampshire County Hospital.—H.S. and [illegible] Each at rate of £125.

Worcester County and City Mental Hospital, Powick, Worcester.—Sen. Asst. M.O. and Deputy Med. Supt.

Births, Marriages, and Deaths

BIRTHS.

BUTLER.—On March 17th, at "Crow's Nest," Orpington, [illegible] wife of M. Kempston Butler, L.D.S. R.C.S. Eng., of [illegible] daughter.

GILMER.—On March 18th, at Rodenbury, Hertford, the [illegible] of Dr. H. S. H. Gilmer, of a daughter.

MARSHALL.—On March 10th, at Bournemouth, the wife [illegible] Charles W. Marshall, M.D., of Sturminster Newton, Dors [illegible] of a daughter.

TOWNSEND.—On March 17th, at Welbeck-street, W., the w [illegible] of Dr. C. Geoffrey Townsend, of Mowbray, Beaconsfiel [illegible] Bucks, of a daughter.

DEATHS.

DISTIN.—On Friday, March 18th, at Moorlands, Paignt [illegible] Howard Distin, M.B. Lond., M.R.C.S., L.R.C.P., ag [illegible] 66 years.

HANNA.—On March 14th, at Exmouth, George Henry Han [illegible] M.D. Edin.

SMITH.—On March 17th, suddenly, in London, William Rob [illegible] Smith, Colonel, R.A.M.C. (ret.), Knight Bachelor, M. [illegible] D.Sc., LL.D., Emeritus Professor of Forensic Medicine [illegible] the University of London, Founder, President, and Princi [illegible] of the Royal Institute of Public Health, aged 82.

TURNER.—On March 18th, at 73, Onslow-gardens, Muswell H [illegible] Nathaniel Henry Turner, M.R.C.S., D.P.H. (formerly [illegible] Edgbaston and Highbury-grove, London), second son [illegible] the late Frederic Turner, of Nizels, Hildenborough, in [illegible] seventy-second year.

WHITCOMBE.—On March 13th, at Nice, of heart failure follow [illegible] an operation, Philip Percival Whitcombe, M.B. Lon [illegible] aged 73.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices [illegible] *Births, Marriages, and Deaths.*

MANCHESTER AND SALFORD HOSPITAL FOR SK [illegible] DISEASES.—At the annual meeting last week it was repor [illegible] that this institution which, when it was founded in 1 [illegible] treated some 600 patients in a year, is now treating 400 o [illegible] patients in a day, and that more than 100 forms of s [illegible] disease are being dealt with. The Manchester pu [illegible] health committee has accepted it as an approved cen [illegible] for the treatment of skin disease, and the out-patie [illegible] department is now entirely inadequate. Many patie [illegible] are paying towards the cost of their treatment, but m [illegible] than 90 per cent. of the men and 30 per cent. of the wo [illegible] are panel patients. Dr. Louis Savatard, one of the honor [illegible] physicians, pointed out that without a voluntary hospi [illegible] of this kind it would be difficult for panel patients suffer [illegible] from skin diseases to receive efficient treatment.

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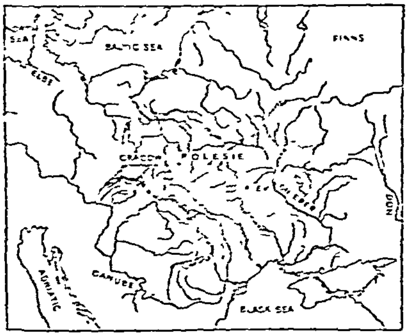
HE CRADLE OF THE SLAVS.—Evidence ints to Polesie as the place of origin of the avs. This district is shown to the north of the rpathians in the shaded porn of the accompanying map. ere began the movement which s resulted in the building up five modern states. Expansion to the Balkans assumed enomenal proportions in the th and seventh centuries A.D. e Slavs eventually added the st area shown in the unshaded rtions of the map to their original territory. During these movements the nucleus of the future Russian state was developing around Kiev, while princes of certain Slav tribes in Bohemia struggled for supremacy until the ascendancy of a member of the Čech tribe, who gave his name to the state. The Bulgars formed their first kingdom in the seventh century; in the tenth, the Polish nation emerged whilst the Serbs were successfully building up a kingdom.



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